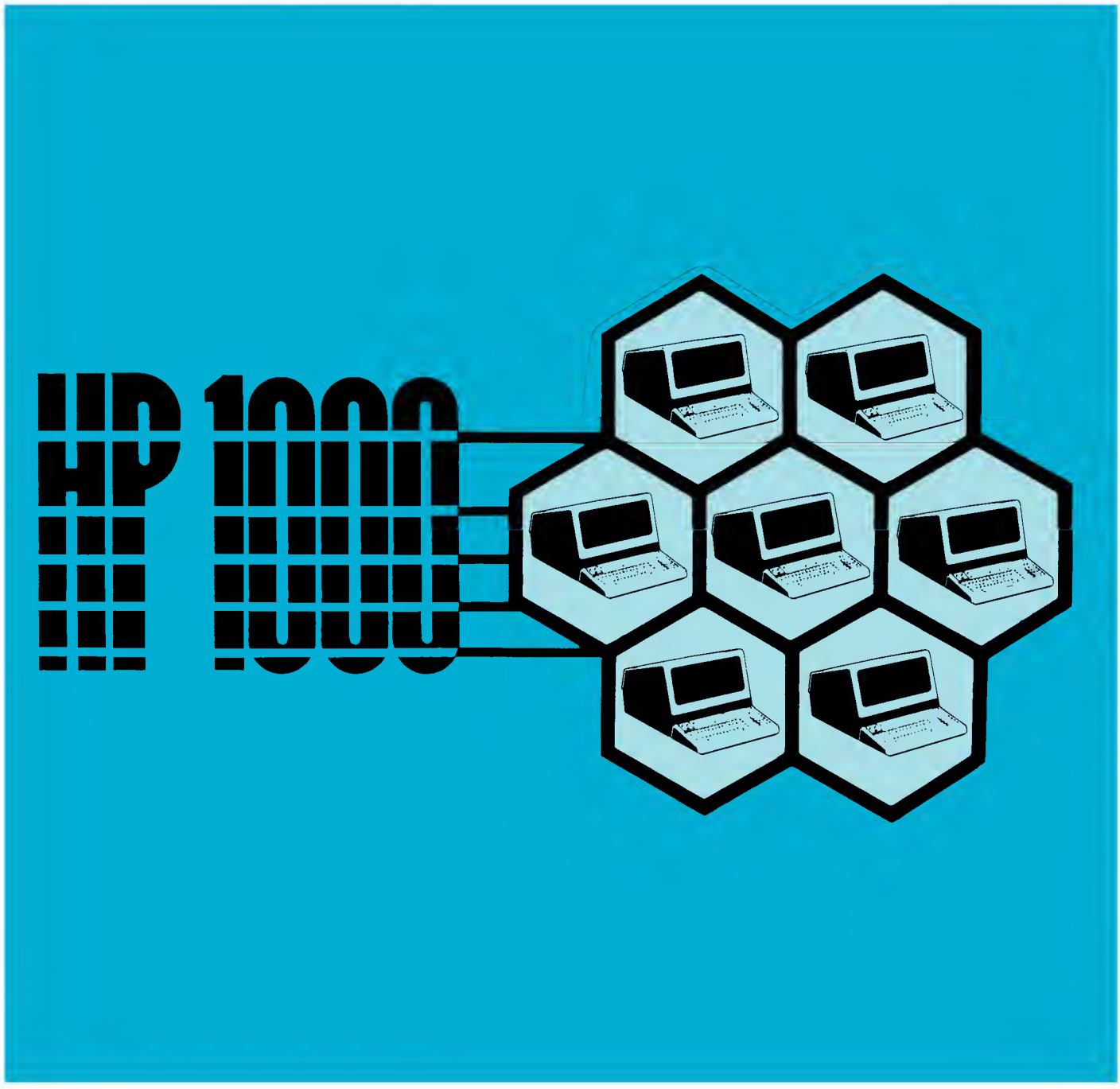
HEWLETT PACKARD

HP 92068A
RTE-IVB On-Line Generator

Reference Manual



RTE-IVB On-Line Generator Reference Manual

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PRINTING HISTORY

The Printing History below identifies the Edition of this Manual and any Updates that are included. Periodically, Update packages are distributed which contain replacement pages to be merged into the manual, including an updated copy of this Printing History page. Also, the update may contain write-in instructions.

Each reprinting of this manual will incorporate all past Updates, however, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with its user-inserted update information. New editions of this manual will contain new information, as well as all Updates.

To determine what manual edition and update is compatible with your current software revision code, refer to the appropriate Software Numbering Catalog, Software Product Catalog, or Diagnostic Configurator Manual.

Second Edition ..... Jan 1980
Update 1 ..... Apr 1980
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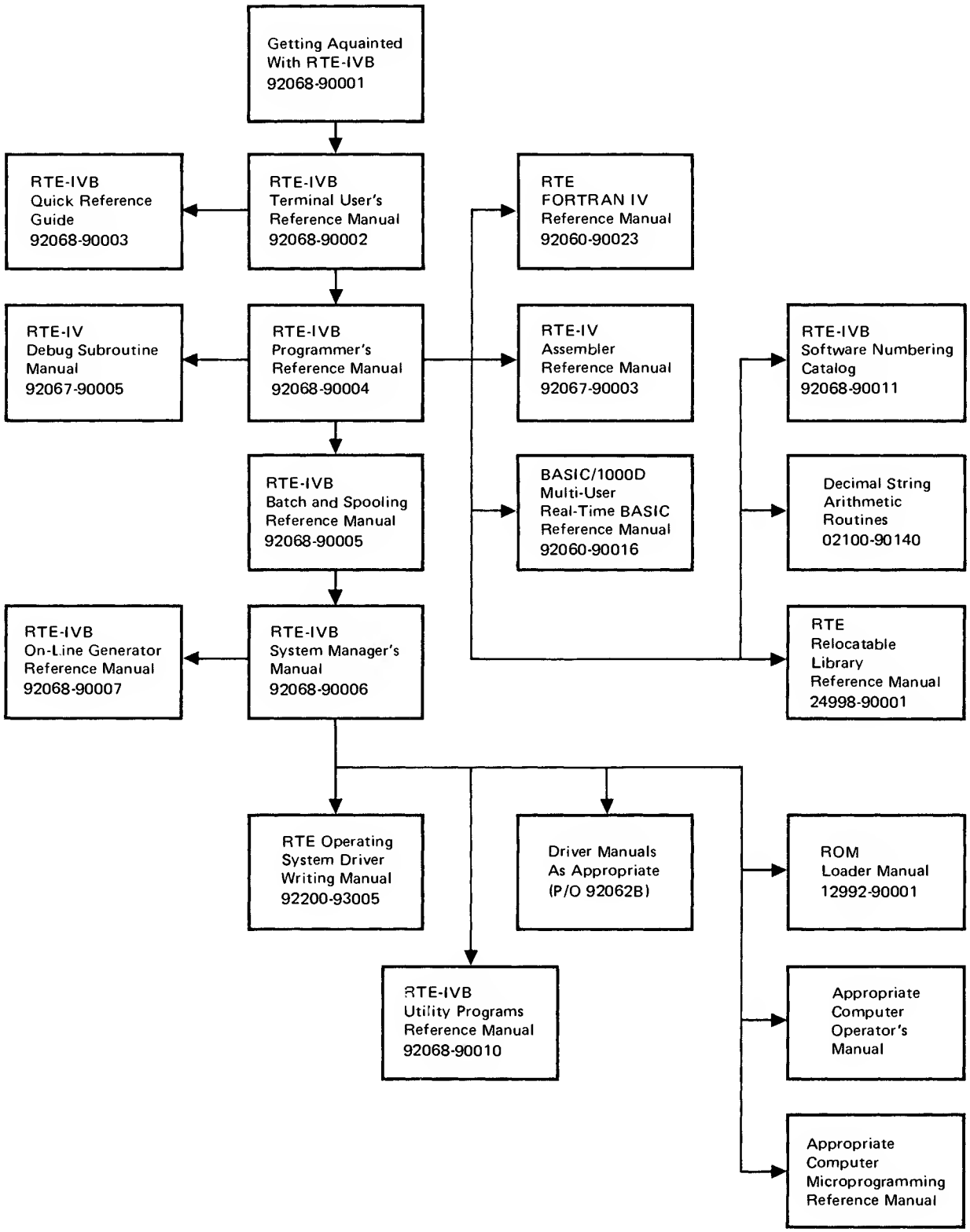
RTE-IVB DOCUMENTATION MAP



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Preface

This manual describes RT4GN, the RTE-IVB On-Line Generator program. The On-Line Generator allows you to generate a new RTE operating system on-line, without shutting down your current RTE operating system. The program executes in the background disc resident program area.

The manual is intended for a system programmer or system manager who has some experience using the HP RTE-IVB operating systems. Before using the On-Line Generator, you should be familiar with the RTE-IVB operating system. The Documentation Map shown on the page following this Preface gives the titles and part numbers of the manuals that provide additional information that will be useful in generating an RTE-IVB system.

The sections within this manual describe the operating specifications for the On-Line Generator, as follows:

Chapter 1 - An introduction to the On-Line Generator, including a description of the features and the operating environment. Also included are general descriptions of the RTE-IVB operating system and typical system configurations that are used within this manual as a basis for examples and a sample generation.

Chapter 2 - Describes how to prepare your responses to the generator questions. Worksheets are included on which you may record the responses that are required to generate your operating system. Sample worksheets are provided.

Chapter 3 - Describes system generation using the On-Line Generator. Included are instructions on how to schedule the generator for execution, and how to enter your responses. Multiple terminal operation, error handling, number systems, and the generator scratch file are discussed.

A sample generation based on a typical RTE-IVB system definition is presented.

Appendix - Eight appendices are included in the manual:

A. HP Character Set

B. RTE-IVB MEMORY ORGANIZATION

C. RTE-IVB System Disc Layout

D. Generation Worksheet Forms

E. Sample Answer File

F. Sample Generation Listing

G. Error Summary

H. RTE-IVB Program Types

Other manuals that offer information relevant to generating and using an RTE-IVB operating system are briefly summarized below:

* RTE-IVB Programmer's Reference Manual

This manual is required for those involved with RTE-IVB system generations. It describes the functions of RTE-IVB and the procedures for utilizing system services by both executing programs and programs being developed. Typical examples of program use of system services are also provided.

* RTE Operating System Driver Writing Manual

  This manual provides an overview of the RTE I/O Structure and describes real-time input/output considerations common to site-specific I/O drivers.

* RTE Terminal User's Reference Manual

  This manual describes both the Operating System and File Management System commands. RTE Editor (EDITR) commands and the procedures for utilizing all on-line editing services are given (e.g., this manual would be a useful resource in the creating and updating of an answer file that contains correct responses to RT4GN queries).

* Appropriate Driver Manuals

  These individual manuals will aid the user in determining the particular drivers necessary for his site-specific combination of devices. The manuals describe the buffering, DCPC, time-outs, and EQT extensions necessary for configuring the various drivers.

* Appppropriate Subsystem Manuals and Configuration Guides

  These manuals provide the information necessary for configuring any optional subsystems the user may choose to include in his system.

* RTE-IVB System Manager's Manual

  This manual guides the RTE System Manager through the overall process of planning, generating, initializing and maintaining his RTE system. It provides procedures for planning your I/O structure, disc structure, and generating specific 92068B software components.

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List of Illustrations

Chapter 1
Introducing RTE-IVB On-Line System Generation

Using this Manual

The RTE-IVB On-Line Generator Reference Manual provides a set of basic procedures for generating an RTE-IVB system to your specifications. It is suggested that all new users read through this manual before beginning a system generation. The user should become familiar with the terms in the glossary and the information that is contained in the various sections and appendices before attempting to generate a system. Note that sample worksheets are provided throughout the manual. Blank generation worksheets are provided in Appendix D.

The RTE-IVB System Manager's manual should be used in conjunction with this manual as it will lead through the processes required to plan, generate, and initialize your system.

The On-Line Generator Manual discusses generator inputs in general terms only. For specific generator inputs several other RTE-IVB manuals should be readily at hand when filling out the worksheets for your generation: the RTE-IVB System Managers Reference Manual, the various driver manuals, and the appropriate subsystem manuals and configuration guides (see the Preface in this manual for summary descriptions).

Examples are used and referenced throughout the manual to illustrate or clarify information. These examples should be regarded as general information only, since in some cases they may not necessarily reflect the most recent software revisions.

Note that unless otherwise noted in this manual, all references to logical and/or physical memory size are in decimal number of words. Logical memory addresses are in octal.

The RTE On-Line Generator

The RTE-IVB On-Line Generator (RT4GN) is included in the software modules distributed with the HP RTE-IVB Real-Time Executive Operating System.

The On-Line Generator program gives you the capability of using your current RTE system to create a different RTE operating system on-line. The On-Line Generator configures an RTE-IVB system based on the information that you enter in response to queries and prompts displayed by the On-Line Generator.

To build the operating system, the On-Line Generator accepts the relocatable programs from disc files. These relocatable programs must exist as File Management Package (FMP) disc files (but cannot be Type 0 files). The On-Line Generator uses these files to build the new system. RT4GN relocates both the required modules and the selected optional software modules and configures the system according to your responses to its queries. The resultant user-defined absolute RTE-IVB system is stored in a Type 1 FMP file created by the generator.

SWTCH, the RTE-IVB system transfer program, is also included in the software modules distributed with RTE-IVB. This utility program transfers the new operating system from the file created by the On-Line Generator to a disc subchannel. You can replace (using SWTCH) the current (or another) operating system with the new operating system by following the detailed procedures described in the System Manager's Manual.

On-Line Generator Features

The On-Line Generator has the following features:

* The generation process can be directed from an answer file, logical unit, or user console.

* The TR command can be used at any time to change modes between interactive (operator) and direct (answer file or logical input unit).

* An HP 7900, 7905, 7906(H), 7920(H) or 7925(H) disc-based system can be generated.

* Mapping and linkage options may be set for the individual relocation of modules.

* The generation listed output can be echoed to both the user console and the specified list file.

* During relocation, the RTE-IVB generator automatically searches all libraries specified during the Program Input Phase. It is not necessary for the user to request library searches for external references.

* The generator can be aborted by entering the proper request (two exclamation points, "!!") when in either the interactive mode (by you, the operator) or the direct mode (from an answer file).

RTE-IVB Generation Requirements

The following minimum requirements are necessary for generating an RTE-IVB system:

* RTE-IVB minimum 96K byte system (running on an HP 1000 M, E, or F Series Computer) including:

* Minimum 14 page (1 page = 2K bytes) partition (includes a 2K byte base page area); however, the larger the partition the faster the generator will proceed.

* Sufficient FMGR disc tracks to contain the generated system and (optionally) the list file and boot file.

* Scratch area of six tracks (temporary work area).

* SWTCH utility program.

NOTE

> The page requirements for the On-Line Generator must be increased during relocation to allow for dynamic table space (a minimum 16 page partition is recommended). The generator may be run as a large background (Type 4) program.

Operating System Description

Your RTE-IVB system is structured from a set of software and hardware modules. Beyond minimum requirements (i.e., RTE system modules and drivers), the combination of software and hardware modules is flexible to allow the creation of a system designed specifically to handle your requirements.

RTE-IVB is a multiprogramming system that divides user memory into contiguous blocks of memory called partitions. The maximum physical memory size is 2048K bytes. The physical memory area not occupied or reserved by system requirements and memory resident programs is divided into user partitions. The size and number of these partitions are defined by the user during system generation (the size of the partitions may be modified at system boot-up during reconfiguration).

Up to 64 user partitions can be declared permitting up to 64 disc resident programs to reside in memory at one time.

RTE-IVB allows several programs to be active concurrently, each program executing during the unused central processor time of the others.

All input/output and interrupt processing is controlled by RTE-IVB, except for special privileged interrupts that circumvent RTE-IVB for quicker response. When a program requests a non-buffered I/O transfer, RTE-IVB places the program in an I/O suspend state, initiates the I/O operation, and starts executing the next highest priority scheduled program. When the I/O transfer is completed, RTE-IVB reschedules the suspended program for execution. (Buffering allows program swapping while program I/O is being performed.)

User programs can be written in Assembler, or a variety of high level languages.

Programs are scheduled by time intervals, an external event, an operator request, or by another program. (A program may also be scheduled for execution at system bootup.) The RTE-IVB operating system includes software that resolves program competition for CPU time at the same priority.

Physical memory in the RTE-IVB system is divided into areas for the system, memory resident programs, driver partitions, and a series of partitions used for execution of disc resident programs. The basic purpose of the generation is to build various system tables, relocate binary programs specified at generation time, and construct a structured system according to a specific memory configuration. During generation, various program modules are loaded, and generator questions are answered by the user. The memory resident parts of the system (and system tables) are constructed and stored on the disc to be brought into memory during bootup. Drivers are relocated to reside in driver partitions. The remainder of memory is divided into partitions for disc resident programs, and these programs are relocated and saved on the disc to be transferred into memory when needed. The relocatable subroutine library is saved on the disc for use by programs relocated be the RTE On-Line Loader (LOADR) during normal system operation.

NOTE

> Be aware that certain software subsystems may have specific requirements when included in the system generation. Options in areas such as spooling, measurements, communications, and multiple terminal operation may place specific requirements on I/O configuration, buffer space, etc. Refer to the RTE-IVB System Managers Manual and the appropriate subsystem and configuration manuals.

The RTE-IVB System to be Generated

A sample system for RTE-IVB will be defined for discussion within subsequent portions of this manual, and the sample system will be used for examples and descriptive material. Your system may differ from the one defined here, but you only need to add or delete the appropriate modules in your generation process.

A sample RTE-IVB system (and the one that is used as an example in this manual) could be comprised of the following modules:

Hardware Modules	Software Modules
HP 2117 Computer	RTE-IVB Memory Resident System
512K Word Main Memory	RTE-IVB System Library
Memory Protect	Power Fail Driver, DVP43
TBG (Time Base Generator)	RTE HELP Utility
DCPC (Dual Channel Port Controller)	RTE-IVB LOADR (Relocating Loader)
DMS (Dynamic Mapping System)	RTE Accounts Program
HP 7925 Disc Subsystem	AUTOR (Power Fail/Auto Restart)
HP 7906H Disc	RTE-IVB SWTCH Transfer Program
HP 2645 System Console	HP 7905/7906/7920/7925 Disc Driver, DVR32
Line Printer	HP 7906H/7920H/7925H Disc Driver, DVA32
Magnetic Tape Device	RTE-IVB WHZAT Inquiry Program
HPIB (Hewlett-Packard Interface Bus)	HP LGTAT Utility Program
HP 264X Terminals (7 each)	RTE Compiler Library
	RTE Relocatable Library
	263X/264X Terminal Driver, DVR05
	Line Printer Driver, DVA12
	Magnetic Tape Driver, DVR23
	HPIB Driver, DVR37
	RTE-IVB Spool Program
	File Manager Program
	File Manager Library
	Memory Resident Programs
	Disc Resident Programs

Chapter 2
On-Line Generator Program Response Preparation

Planning Introduction

Generation planning involves determining what software resources and services are to be incorporated into your resident operating system and how those resources are to be allocated to maximize their usage. The resources and services desired are specified at generation time in a dialog with the On-Line Generator. You prepare your responses to the generator queries by first filling out the generation worksheets that are provided in this manual.

Some of the data that will be entered in the worksheets is transferred from other documentation (i.e., RTE-IVB System Managers Manual and other relevant subsystem manuals and configuration guides). Other worksheet entries are based on decisions you make after considering your requirements in the context of the optional resources and the memory allocation considerations described in this Chapter.

The generation worksheets that are provided in Appendix D follow the progression of the generation (as described in Chapter 3). When RT4GN is executed, the information that you entered on the worksheets can be easily transferred to the system console (or answer file) in response to the generator's queries.

On the worksheets, user responses and commands are written in capital letters, and generator outputs and queries are printed in boldface type (blanks indicate where user input is expected). Comments to aid the user in filling out the worksheets are included in parentheses.

As you become more familiar with the RTE-IVB system and the on-line generation procedure, you can create an answer file that contains all the parameter input responses derived from the worksheets. A sample answer file for an RTE-IVB generation is included in Appendix E. The generator will read such a file automatically and operate at a much higher speed than if the responses are entered interactively through a user console.

On-Line Generator Dialog

The On-Line Generator dialog is described in this section. The section is organized in parallel with the "phases" executed by the generator during its operation. Some phases do not require user responses but have been listed for completeness. The phases include:

* Initialization -- The list and output files are established. The destination system disc type and its subchannels are defined. The bootstrap loader is produced (optional). Various system parameters are entered.

* Program Input -- All relocatable file names are entered, together with information that directs their relocation. The generator uses these entries for later relocation of the file contents.

* Parameter Input -- The default characteristics of programs that were just entered can be overridden. Entry point values can be modified. Additional system parameters are entered.

* Table Generation -- Tables describing the I/O configuration are constructed. Table Area I modules are relocated.

* System Boundaries -- The driver partition size is reported, and you may increment the driver partition page size; driver partition #1 is relocated. The Subsystem Global Area (SSGA) is relocated as the first part of COMMON. COMMON sizes and boundaries are reported, and you may increase the size of these areas.

* System Loading -- The System Driver Area drivers, Table Area II modules, system executive routines, and user written system routines are relocated to absolute memory addresses. Then the remaining partition resident drivers are relocated.

* Program Loading -- The Memory Resident Library (MRL) and all memory resident programs are sequentially loaded into the memory resident area. Program relocation continues with real-time disc resident and background disc resident programs.

* Partition Definition -- This phase begins with a listing of real-time and background program partition size requirements (in pages). This is followed by a report giving the maximum program address spaces for disc resident programs. At this point you may increase the size of System Available Memory. The generator reports the number of pages remaining for partitioning. After this report you define the partitions, and you may modify a program's page requirements. Finally, you may assign specific programs to execute only in specified partitions.

At the end of the generation the On-Line Generator reports that the new system is stored in the type 1 file. The size of the system is reported in decimal number of tracks and sectors and in decimal number of blocks.

Error Reporting

Error conditions encountered during On-Line Generator execution result in the display of numbered error codes. A description of all error codes and appropriate corrective actions are given in Appendix G.

Operator Commands

The following three sections describe the TR, *, !!, and BR commands. The TR, * and !! commands can be entered during the generation process at any point that the generator is waiting for input. The comment command (*) can be used to include comments (partial or complete lines) in the listing and answer file.

TR COMMAND

You may provide responses to the On-Line Generator using two modes of operation -- interactive or direct. The interactive mode is a two-way dialog between you and the generator. The generator displays messages at your console to prompt you for the information it needs to generate an RTE system. You answer the prompts by supplying the required information via your keyboard.

When answers are supplied to the generator from a disc file or a logical input unit, the mode of operation is direct (i.e., from an answer file).

You can alternate between these operating modes at any point that the generator is waiting for input. That is, you may enter the TR command from the user console to transfer to an answer file or logical input unit. Conversely, you may include a TR command within your answer file to transfer to another file or device for input. Transfers can be nested to a level of ten. Any transfer request beyond this limit results in a GEN ERR 19 (see Appendix G). The command format is:

```
TR    ,lu
      ,filename
```

where:

lu is the logical unit number of an interactive device or of a non-disc device that contains an answer file.

filename is the name of a disc file that contains answers to the generator prompts. The filename format is:

```
filename[:security code[:cartridge label]]
```

Transferring to an illegal logical unit for command input results in a GEN ERR 20 (see Appendix G). The error will be listed on the user console, and a valid LU number can then be entered.

Once you transfer to a device or file, you may transfer back to the previous device or file by entering a TR with no parameter.

When an end-of-file is encountered in the answer file, an automatic TR to the previous device or file is generated. Similarly, a transfer to the user console occurs when an error is detected. You can then enter the TR command to transfer back to a device or file.

You may include a TR command within your answer file (e.g., in the form TR,1), which results in a transfer of control to the user console (Logical Unit 1). When the TR,lu command is encountered in the answer file, the generator redisplays the current prompt (for the answer it is expecting) on the user console and waits for input from the console. You may enter the appropriate responses, followed by a TR command. This TR command then causes a transfer of control back to the answer file record that follows the original TR,lu command in the answer file. The transfer feature is useful if some answer is not known until a certain point in the generation process is reached.

Alternate versions of the TR command can also be used. For example, each of the following produces an identical result:

```
TR,1
:1
,1
```

Below are several examples that illustrate the usage of the TR command:

1. In the following example, generation is partly interactive and partly run from an answer file.

User Input	Current Generator Query	Answer File (ANSFL) Input
:RU,RT4GN		
	LIST FILE NAMR?	
LIST4::2::100		
	RTE-IVB GENERATOR MODEL 92068A 3:30 PM TUE., 10 APR., 1979	
	ECHO?	
YES		
	OUTPUT FILE NAMR?	
TR,ANSFL		
		RTEIVB::2::3000
	SYSTEM DISC MODEL?	
		7925
	CONTROLLER SELECT CODE?	

```
                        MODEL,#TRKS,FIRST CYL,HEAD,
                        #SURFACES,UNIT,#SPARES
                        FOR SUBCHNL:
                        00?
                                                    TR
                        00?
7925,244,0,0,9,0,8
                        .
                        .
```

2. In the following example, part of the initialization phase is run from the answer file.

User Input	Current Generator Query	Answer File (ANSFL) Input
:RU,RT4GN,ANSFL		
	LIST FILE NAMR?	
		LISTFL:AB:17::300
	RTE-IVB GENERATOR MODEL 92068A 3:30 PM TUE., 10 APR., 1979	
	ECHO?	
		YES
	OUTPUT FILE NAME?	
		OUTFL:AB:17::2500
	SYSTEM DISC MODEL?	
		TR,1
	SYSTEM DISC MODEL?	
7925		
	CONTROLLER SELECT CODE?	
11		
	MODEL,#TRKS,FIRST CYL,HEAD, #SURFACES,UNIT,#SPARES FOR SUBCHNL: 00?	
7925,256,0,0,9,0,5		
	01?	
7925,1730,29,0,9,0,52		
	02?	
7925,2016,227,0,9,0,63		
	03?	
7925,256,458,0,9,0,8		
	04?	
7925,2942,485,0,9,0,82		
	05?	
/E		
	SYSTEM SUBCHNL?	
TR		
		0
	AUX DISC?	
	.	
	.	

*COMMAND

The * command is used to include documentation comments for both answer file preparation and list file reading.

Comment lines must begin with the comment declaration, asterisk (*). When the generator is waiting for input, it simply skips over any comment line and gets the next response line without reissuing the prompt. Note that when the generator encounters an asterisk, the remainder of the line is considered to be a non-executable statement.

NOTE

Any comments entered (via either the user console or an answer file) prior to your response to the LIST FILE NAMR? query will not appear in the list file.

Comments may be included on the same line as a user response by entering an asterisk after the response (the response and the asterisk should be separated by several blanks for clarity in reading).

There are certain restrictions that exist when the response refers to a file name. In this case, asterisks are not allowed within file names, security codes, or cartridge labels. Therefore the following file names would be incomplete because the generator considers the * a comment declaration:

```
OUT*FL::2::20000   (in this case, OUT would be the file name,
                    *FL::2::2000 would be considered a comment)
TR,ANSF:*:10
REL,NCRSYS::*
```

The commands affected by these restrictions are:

TR
RELOCATE

Responses affected by these restrictions are:

LIST FILE NAMR? response

OUTPUT FILE NAMR? response

BOOT FILE NAMR? response

!! (Abort) and BR (Break) Commands

The abort command is entered to direct the generator to close all files (see below) and terminate itself. The command format is:

!! (entered in columns 1 and 2)

This command may be entered at any time the generator is waiting for input.

CAUTION

> If a name has two exclamation points as its first and second characters (for example, a file named !!ABC) and is to be entered as the first input parameter in response to a generator prompt, you must insert a space in front of the file name. Otherwise the generator will interpret the entry as an abort command.

The generator can also be aborted with the RTE system break (BR) command:

```
*BR,RT4GN
```

The generator will then close all files and terminate itself. If you are using a copy of RT4GN, be sure to use the name of that copy when you use this command.

The abort commands cause the absolute output file, the boot file, and the generator scratch file to be purged, but the list file will remain for your examination.

Response Preparation

In the following sections, data output by the generator is shown in bold face type. As you read these sections, you should fill in generation worksheets with your generator inputs. You will need to refer to the RTE-IVB System Manager's Manual and appropriate subsystem manuals and configuration guides for specific responses.

These worksheets are keyed to generation step numbers in the text. Blank generation worksheets are located in Appendix D. Sample filled in worksheets are located at the end of each section.

NOTE

In the following sections, information not directly used by the generator will be offset from the main texts.

This information will include optional resource usage considerations, general system background information and examples. It is recommended that the new user familiarize himself with this information.

Initialization Phase

During this phase, the On-Line Generator first requests information that is required to create the list and output files and to determine the destination system disc type. The system disc type is the disc model containing LU2 in the generated system. The generator then requests information to set up the track map table that defines disc subchannels. Once the track map table is established, the generator requests additional information that is necessary to begin generation of the system.

Refer to the example given in Figure 2-1 as you follow the steps in the Initialization Phase.

STEP 1 -- LIST FILE NAMR?

Enter either the name of a file, or the logical unit number of a device that will receive the generator listed output. The filename format is:

```
filename[:security code[:cartridge label [::filesize in blocks]]]
```

If the filesize is not specified, a default value of 64 blocks will be assumed. (1 block = 128 words)

STEP 2 -- ECHO?

Enter YES to enable a display of all listed output to the user console as well as to the file or device specified in Step 1. If commands are submitted in an answer file, it is especially useful to specify the ECHO option so that the generator's progress can be monitored.

Enter NO to prevent echoing of the listed output.

STEP 3 -- OUTPUT FILE NAMR?

Enter the name of the file to be created for generator output. The system to be generated will reside in this file. The entry format is:

```
filename[:security code[:cartridge label[::filesize]]]
```

Initialization Phase

(1) LIST FILE NAMR?
SYSLI:DB:QQ::450 (generator listed output)

RTE - IV GENERATOR MODEL 92068A 5:41 PM TUE., 1 MAY., 1979

(2) ECHO?
YES (YES or NO; YES echoes all listed output to user console)

(3) OUTPUT FILE NAMR?
SESSY:DB:QQ::4000 (contains generated system, must specify file size in blocks)

(4) SYSTEM DISC MODEL?
7925 (disc model # in destination system)

(5a) HP 7900 Disc Only

CONTROLLER SELECT CODE?
_____ (lower # oct. select code for sys. disc controller)

TRKS, FIRST TRK ON SUBCHNL? (even subchannels - fixed platter, odd subchannels - removable platter; enter dec. values)

0?
_____ , _____

1?
_____ , _____ (terminate your final entry with a /E)

2?
_____ , _____

3?
_____ , _____

4?
_____ , _____

5?
_____ , _____

6?
_____ , _____

7?
_____ , _____

Figure 2-1. Initialization Phase Worksheet Example

(5b) HP 7905/7906/7920/7925 Discs Only

CONTROLLER SELECT CODE?
11 (oct. select code for sys. disc controller)

MODEL, #TRKS, FIRST CYL #, HEAD, #SURFACES, UNIT, #SPARES FOR SUBCHNL:

00?7925,256,0,0,9,0,5 (enter dec.values)

01?7925,1500,29,0,9,0,66 (terminate your final entry with a /E if <32 subchannels defined)

02?7925,193,203,0,9,0,5

03?7925,193,225,0,9,0,5

04?7925,193,247,0,9,0,5

05?7925,193,269,0,9,0,5

06?7925,193,291,0,9,0,5

07?7925,193,313,0,9,0,5

08?7925,193,335,0,9,0,5

09?7925,193,357,0,9,0,5

10?7925,193,379,0,9,0,5

11?7925,193,401,0,9,0,5

12?7925,256,423,0,9,0,5

13?7925,193,452,0,9,0,5

14?7925,193,474,0,9,0,5

15?7925,193,496,0,9,0,5

16?7925,193,518,0,9,0,5

Figure 2-1. Initialization Phase Worksheet Example (Cont.)

(5b) HP 7905/7906/7920/7925 Discs Only (Continued)

17?
7925, 193, 540, 0, 9, 0, 5

18?
7925, 193, 562, 0, 9, 0, 5

19?
7925, 193, 584, 0, 9, 0, 5

20?
7925, 193, 606, 0, 9, 0, 5

21?
7925, 193, 628, 0, 9, 0, 5

22?
7925, 193, 650, 0, 9, 0, 5

23?
7925, 193, 672, 0, 9, 0, 5

24?
7925, 96, 694, 0, 9, 0, 3

25?
7925, 150, 705, 0, 9, 0, 3

26?
7925, 96, 722, 0, 9, 0, 3

27?
7925, 96, 733, 0, 9, 0, 3

28?
7925, 194, 744, 0, 9, 0, 4

29?
7925, 194, 766, 0, 9, 0, 4

30?
7925, 194, 788, 0, 9, 0, 4

31?
7925, 114, 810, 0, 9, 0, 3

Figure 2-1. Initialization Phase Worksheet Example (Cont.)

(5c) HP 7906H/7920H/7925H/9895 Discs

CONTROLLER SELECT CODE?
12
(oct. select code for sys. disc controller)

MODEL, # TRKS, FIRST CYL #, HEAD, # SURFACES, ADDRESS, # SPARES (, UNIT) FOR SUBCHNL:

00? 7906H, 256, 0, 0, 2, 1, 8, _____ (enter dec.values)

01? 7906H, 203, 132, 0, 2, 1, 5, _____ (terminate your final entry with a /E if <32 subchannels defined)

02? 7906H, 203, 236, 0, 2, 1, 5, _____

03? 7906H, 138, 340, 0, 2, 1, 4, _____

04? 7906H, 203, 0, 2, 1, 1, 5, _____

05? 7906H, 198, 208, 2, 1, 1, 5, _____

06? 7906H, 400, 0, 3, 1, 1, 11, _____

07? _____

08? _____

09? _____

10? _____

11? _____

12? _____

13? _____

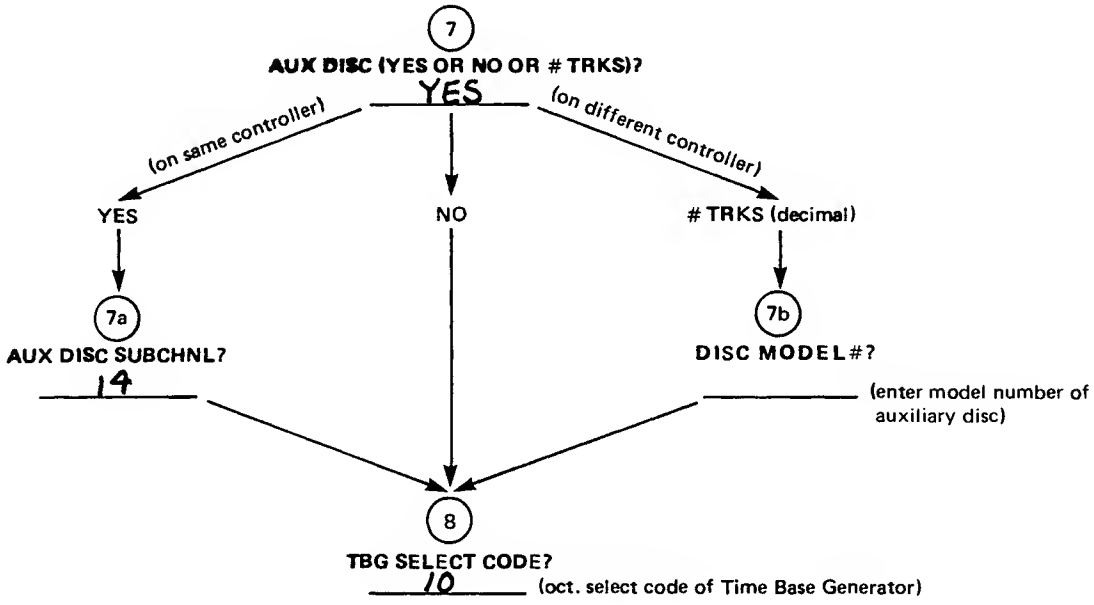
14? _____

15? _____

16? _____

Figure 2-1. Initialization Phase Worksheet Example (Cont.)

(6) SYSTEM SUBCHNL?
0



(9) PRIV. INT. SELECT CODE?
0 (oct. select code or 0)

(10) MEM. RES. ACCESS TABLE AREA II?
YES (YES or NO)

(11) RT MEMORY LOCK?
YES (YES or NO)

(12) BG MEMORY LOCK?
YES (YES or NO)

(13) SWAP DELAY?
50 (dec. value from 0 to 255 - represents tens of milliseconds)

(14) MEM SIZE?
512 (dec. # of memory pages > 48)

(15) BOOT FILE NAMR?
0 (file or LU # or 0)

Figure 2-1. Initialization Phase Worksheet Example (Cont.)

The generator must create the output file as a Type 1 file, so a file type specified in the fourth NAMR parameter will be ignored. Because Type 1 files cannot be extended, a sufficient number of blocks to contain the generated system must be specified in the file size parameter. If enough blocks are not specified, the generator will be aborted when the output file overflows with a GEN ERR 17.

The generator does a range check to make sure the file size is at least 1000 blocks; if not, a GEN ERR 17 will result. Unused file space will be returned to the system when the generation is completed, so estimate a high value.

> A recommended entry for a small system would be 2500. The actual number of blocks used will be reported at the completion of the on-line generation.

STEP 4 -- SYSTEM DISC MODEL?

Enter 7900; Multiple Access Controller (MAC) disc, 7905, 7906, 7920, or 7925; or Integrated Controller Disc (ICD) 7906H, 7920H, or 7925H, depending on the model of disc in the destination system (where the new RTE-IVB system will reside).

STEP 5a -- If the response to SYSTEM DISC was 7900, the following dialog occurs:

```
CONTROLLER SELECT CODE?
```

The 7900 controller occupies 2 select codes; enter the lower number (highest priority) octal select code for the system disc controller.

```
# TRKS, FIRST TRK ON SUBCHNL
  0?
```

Enter the decimal number of tracks and the beginning track number (separated by a comma) for subchannel 0. The values are obtained from the HP 7900 Disc Worksheet that was filled out during the planning stage. (Refer to the System Managers Manual).

The generator will continue to display a subchannel number following each entry up to subchannel 7, or until terminated by the entry of the input data terminator, /E.

The even numbered subchannels are the fixed platters, and the odd numbered subchannels are the removable platters (i.e., subchannel 0 is the fixed platter, and subchannel 1 is the removable platter of the first disc drive).

> These subchannel inputs enable the generator to build the 7900 track map table, $TB31. This table is located in System Table Area I and is 2*(#subchannels) words in length.

STEP 5b -- If the response to SYSTEM DISC was MAC disc 7905, 7906, 7920, or 7925, the following dialog occurs:

```
   CONTROLLER SELECT CODE?
```

Enter the octal select code for the 13037B/C system disc controller.

```
MODEL,#TRKS,FIRST CYL,HEAD,#SURFACES,UNIT,#SPARES FOR SUBCHNL:
  00?
```

Enter the disc model number, the decimal number of tracks, starting cylinder number, starting head number, number of surfaces, unit number, and number of spare tracks for subchannel 0 (each value separated by a comma). The values are obtained from the HP 7905, 7906, 7920, or 7925 Disc Worksheet that was filled out during the planning stage.

The generator will continue to display a subchannel number following each entry up to subchannel 31, or until terminated by the entry of the input data terminator, /E.

> These subchannel inputs allow the generator to build the 7905/7906/7920/7925 track map table, $TB32. This table is located in System Table Area I and is 1+5*(#subchannels) words in length.

STEP 5C -- If the response to SYSTEM DISC was 7906H, 7920H, or 7925H, the following dialog occurs:

```
   CONTROLLER SELECT CODE?
```

Enter the octal select code for the 12821A system disc interface.

```
MODEL,#TRKS,FIRST CYL,HEAD,#SURFACES,ADDRESS,#SPARES(,UNIT) FOR SUBCHNL:
  00?
```

Enter the disc model number, the decimal number of tracks, starting cylinder number, starting head number, number of surfaces, select address number, number of spare tracks for subchannel 0 (each value separated by a comma), and for 9895 disc only, the unit number. The values are obtained from the HP 7906H, 7920H, 7925H or 9895 Disc Worksheet that was filled out during the planning stage. The 9895 can only be a peripheral disc.

The generator will continue to display a subchannel number following each entry up to subchannel 31, or until terminated by the entry of the input data terminator, /E.

> These subchannel inputs allow the generator to build the 7906H/7920H/7925H/9895 track map table, $TA32. This table is located in System Table Area I and is 1+5*(#subchannels) words in length.

NOTE

It is possible to have a system with more than one disc controller or interface card. A renamed version of the disc driver must be generated into the system along with its corresponding track map table supplied by the user. Refer to Appendix B of the System Manager's Manual and the RTE-IVB Drivers DVR32/DVA32 Manual for more information.

STEP 6 -- SYSTEM SUBCHNL?

Enter the system disc subchannel number. (Be sure to specify this same subchannel when defining the Logical Unit 2 entry in the Device Reference Table.) This is the subchannel on which the absolute code will reside for execution. The entry can be any one of the subchannels (with <= 256 tracks) that was defined above, except a 9895 subchannel.

STEP 7 -- AUX DISC (YES OR NO OR # OF TRKS)?

Enter YES to indicate that an auxiliary disc is to exist on the same controller select code as the system disc. A YES response causes the generator to request the subchannel number for the auxiliary disc:

AUX DISC SUBCHNL?

Enter the number of the auxiliary disc subchannel (with <= 256 tracks).

Or enter NO to indicate that there is no auxiliary disc.

Or enter a numeric value (decimal) to indicate that an auxiliary disc with a track count of the specified value is to exist on a controller select code other than the system disc controller select code. In this case, the generator will request the model number of the auxiliary disc:

DISC MODEL #?

Enter any valid number for the aux disc subchannel.

An auxiliary disc is not required, but is sometimes useful for:

* Large file edits
* More type 6 (SAVE PROGRAM) files - see the RTE-IVB Terminal User's Reference Manual
* More general file space
* Decreasing swapping time, since system tracks are allocated from the top of the available track list

downward (i.e., from the last available track towards the first available track in contiguous chunks). This feature permits the auxiliary disc to be used as a "swapping disc". Because LU3 can be on another disc or a controller of a different type, head movement is reduced, thus optimizing a system for speed.

STEP 8 -- TBG SELECT CODE?

Enter the octal select code of the Time Base Generator card. Note that there will be no driver, logical unit number, or EQT number associated with the TBG card.

STEP 9 -- PRIV. INT. SELECT CODE?

Enter the octal select code of the Privileged Interrupt card. Enter a zero if there is no such card on the system. Note that there will be no driver, logical unit number, or EQT number associated with the Privileged Interrupt card. For more information regarding privileged interrupts, see the section on privileged interrupt processing in the RTE Operating System Driver Writing Manual.

STEP 10 -- MEM. RES. ACCESS TABLE AREA II?

Enter YES if Table Area II and the System Driver Area are to be included in the user map for access by memory resident programs.

Enter NO to deny memory resident programs access to Table Area II in the memory resident program map.

The answer to this question will affect the way the System builds the logical map of the memory resident area. Figure 2-2 shows the memory resident maps in either case. Note that a NO response to this question will leave more space in the memory resident map. This additional space can be used to make programs memory resident that will not fit otherwise. However, a YES response is required if memory resident programs:

- Perform EXEC I/O calls to drivers located in the System Driver Area that do not do their own mapping. (These drivers will have the S parameter specified in the equipment table definition of their devices.) Refer to Appendix B for a discussion of the System Driver Area.

- Access modules in System Table Area II. Table Area II contains the system tables, ID segments, some system entry points, and all type 13 modules. Refer to Appendix B for a description of this area.

- Normally default to Type 2 or 3 (Real Time or Background disc resident) programs. Since programs which must run as Type 2 or 3 access Table Area II or SDA, they must have access to these areas if generated as a memory resident (Type 1). Many HP support modules that are defaulted to Type 2 or 3 programs (e.g., SPOUT) have this requirement.

If you are unsure as to the requirements of your memory resident modules, it is suggested that you respond YES to the above question. Refer to Appendix B for a more detailed discussion of the Memory Resident map.

STEP 11 -- RT MEMORY LOCK?

Enter YES to permit any real-time program to lock itself into its partition (disallows swapping of that program if it requests a memory lock).

Enter NO to deny real-time memory locking.

STEP 12 -- BG MEMORY LOCK?

Enter YES to permit any background program to lock itself into its partition (disallows swapping of that program). Note that the SWTCH program requires the BG memory lock capability.

Enter NO to deny background memory locking.

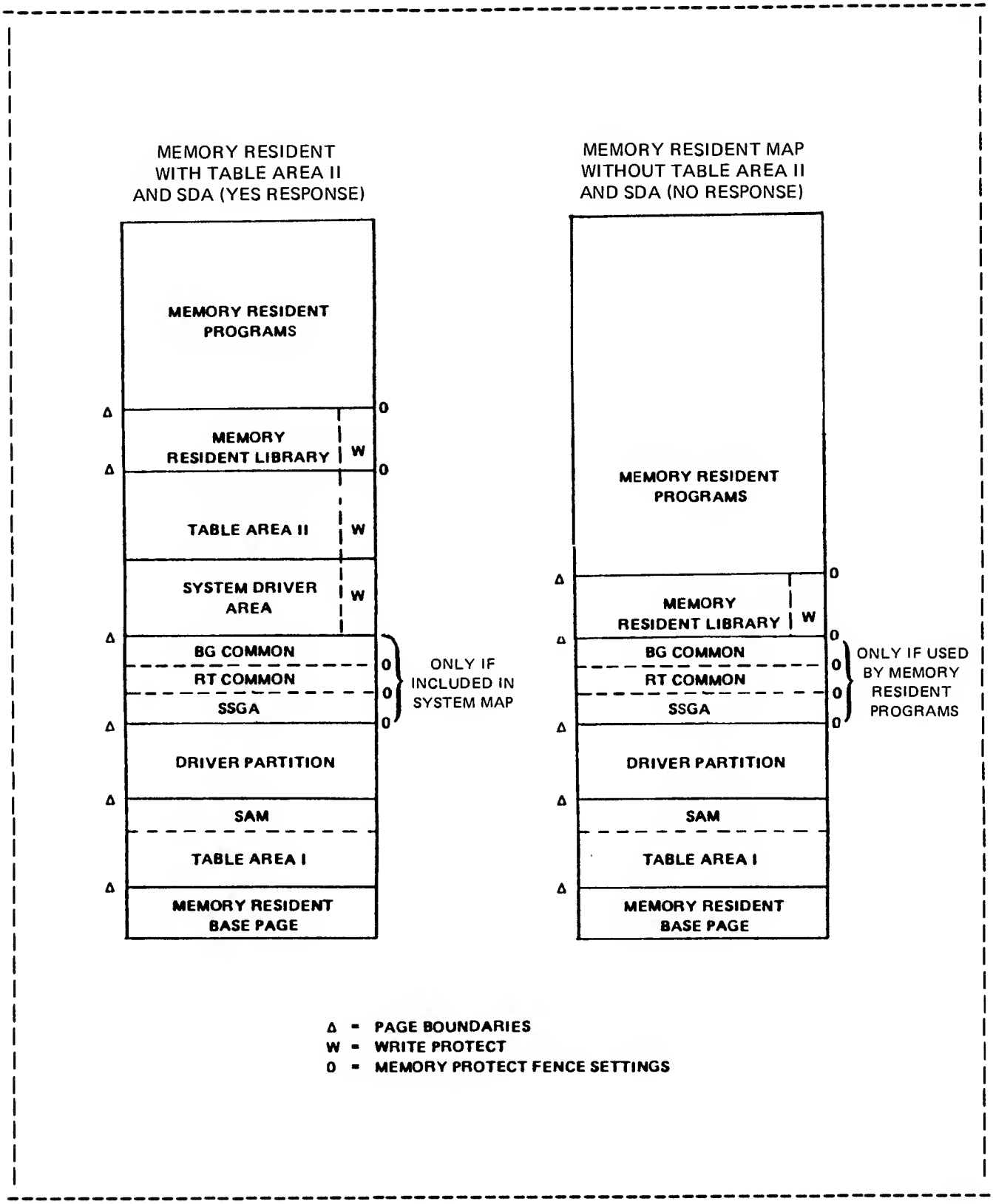


Figure 2-2. Memory Resident Maps

STEP 13 -- SWAP DELAY?

Enter a decimal value in the range of 0 through 255. This value represents tens of milliseconds. The swap delay value specified is applicable to all swappable programs.

"Swapping" is necessary in a multiprogrammed environment where programs must compete with each other for system resources (CPU time, partition space, buffer memory, disc space, etc.). If a program cannot have a resource (for whatever reason), it is suspended until that resource is available; if that program is disc resident, then its partition may be used by another program. If so, then the first program's memory partition is copied to a disc track ("rolled out") where it is saved in its uncompleted and modified state, and the other program is brought in from the disc. During a swap, a check is made to see if work can be done by another program already residing in main memory. I/O operations continue concurrently.

Since a "swap" can take as much as half a second, during which time that partition is idle, and since the DCPC cycles slow down the CPU (because swaps use direct memory access), it is important to minimize needless swapping.

The "swap delay" parameter is one way to control swapping. It is only useful when you have programs that run on a time-scheduled basis, or that schedule themselves with offset, waiting for something. If the current partition resident program is waiting for a particular time of day, if it has a higher priority than other programs that are waiting to execute in that partition, and if the time remaining is less than or equal to the current swap delay, then the current resident remains in the partition (it is not swapped out), and that partition stays unchanged until the time arrives for its resident program to run.

You should adjust the swap delay so that it is longer than the maximum time taken to swap a program out and roll another one in. If it is too short, then the system will waste time swapping the current program out. If it is too long, then the partition will stand "idle" longer than necessary.

The amount of time required for a program to swap depends on several factors: type of disc drive, program length, whether or not the program is segmented, and whether or not the program uses EMA. For the HP 7900 disc drive, the transfer time is 25 milliseconds for each 3K words. For the HP 7905, 7906(H) or 7920(H) disc drive, the transfer time is 16.7 milliseconds for each 6K words. For the 7925(H) disc drive, it is 22.2 milliseconds for 8K words. To calculate swap delay value tailored to memory size, program size, and disc type, refer to Figure 2-3. Note that the graph in this figure takes track switching into account.

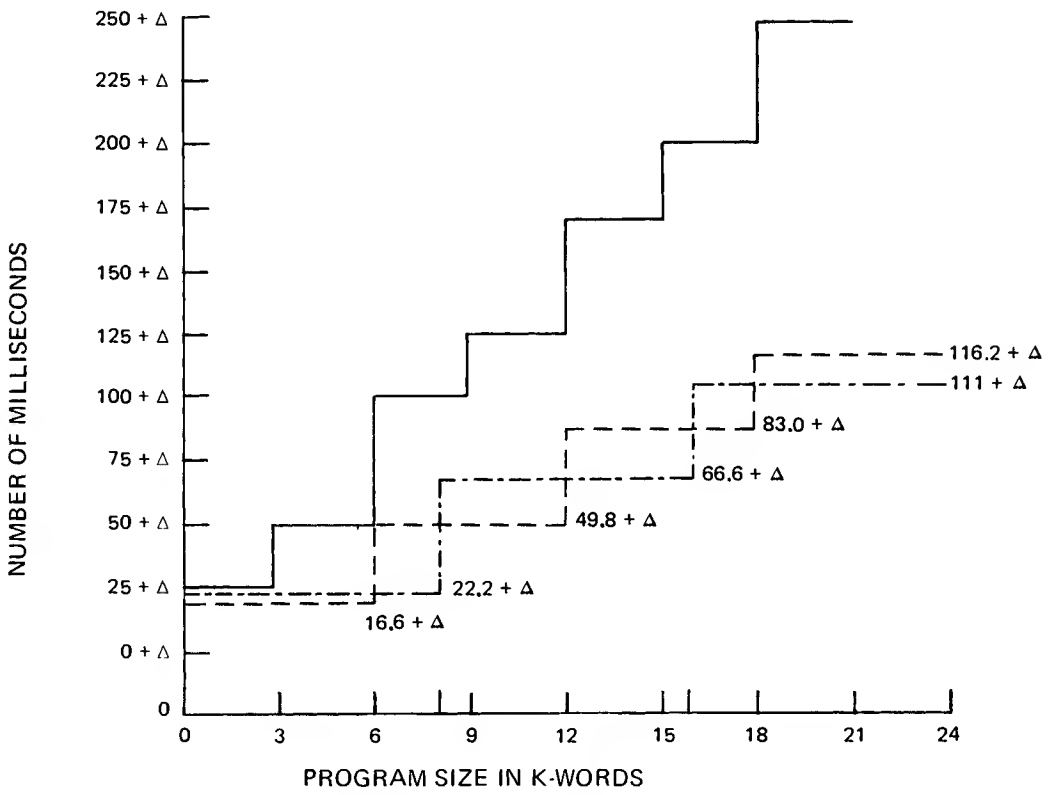
For example, if the value 100 is entered here, a program will not be swapped if it:

1. Resides in a disc resident area

2. Is in the time list

3. Has priority over its competitor for that memory area

4. Is to run within 1000 milliseconds (one second) of the current time.



THIS GRAPH REPRESENTS THE TIME IT TAKES TO READ OR WRITE A PROGRAM (INCLUDING BASE PAGE) TO THE DISC. THE TIMES SHOULD BE DOUBLED TO GET THE TOTAL SWAP TIME.

NOTES:

Δ = AVERAGE ACCESS TIME, WHICH IS COMPOSED OF THE TWO QUANTITIES:

A.
THE ROTATIONAL DELAY. THIS DELAY RANGES FROM 0 TO ONE ROTATION TIME (RT) WITH EQUAL PROBABILITY. THUS THE AVERAGE ROTATIONAL DELAY IS RT/2.

B.
THE SEEK TIME (ST) FOR MOVING HEAD DISCS RANGES FROM 0 TO SOME MAXIMUM WITH A NON-EQUAL PROBABILITY. THE SEEK TIME DEPENDS ON THE LAST ACCESSED TRACK NUMBER.

———HP 7900

—·— HP 7925(H)

- — - HP 7905/7906(H)/7920(H)

Figure 2-3. Swap Delay Graph

EXAMPLE:

USING THE ABOVE PRINCIPLES AND GIVEN THE FOLLOWING DATA FOR VARIOUS DISCS, WE CAN PLOT THE LOAD/SWAP TIME AS A FUNCTION OF THE NUMBER OF WORDS. NOTE THAT THE NUMBER OF WORDS IS AFFECTED BY THE "ALL OF MEMORY BIT".

FOR AN HP 7900:	FOR AN HP 7905/7906(H)/7920(H):	FOR AN HP 7925(H):
RT = 25 MS	RT = 16.66 MS	RT = 22.2 MS
# RT'S/TRACK = 2	# RT'S/TRACK = 1	# RT'S/TRACK = 1
# WORDS/RT = 3K	# WORDS/RT = 6K	# WORDS/RT = 8K
AVERAGE SEEK TIME = 35 MS	AVERAGE SEEK TIME = 25 MS	AVERAGE SEEK TIME = 27 MS
AVERAGE ACCESS TIME = 47.5 MS	AVERAGE ACCESS TIME = 33.3 MS	AVERAGE ACCESS TIME = 38.1 MS

WHERE:

RT = ROTATION TIME

RT'S/TRACK = # OF ROTATIONS REQUIRED TO EXAMINE DATA FROM AN ENTIRE TRACK

WORDS/RT = # OF WORDS PASSING UNDER A HEAD DURING ONE ROTATION

THE SWAP DELAY TIME FOR A 7900 DISC INCLUDES:

1. TIME REQUIRED TO SWITCH HEADS AFTER 3K WORDS OF A TRACK ARE EXAMINED.
2. ROTATION TIME PLUS TIME REQUIRED TO SWITCH HEADS AFTER AN ENTIRE TRACK (6K WORDS) HAS BEEN EXAMINED.
3. RANDOM ACCESS TIME, WHICH IS AVERAGE SEEK TIME PLUS AVERAGE ROTATIONAL DELAY.

THE SWAP DELAY TIME FOR A 7905/7906(H)/7920(H)/7925(H) DISC INCLUDES:

1. ROTATION TIME AFTER 6K OR 8K WORDS (ONE TRACK) ARE EXAMINED.
2. RANDOM ACCESS TIME, WHICH IS AVERAGE SEEK TIME PLUS AVERAGE ROTATIONAL DELAY.

Figure 2-3. Swap Delay Graph (Cont.)

STEP 14 -- MEM SIZE?

Enter a decimal value (minimum 48) indicating the total number of memory pages (1 page = 1K words = 2K bytes) in your system; that is, 48 for 48K, 64 for 64K, 128 for 128K, etc. (maximum 1024K).

STEP 15 -- BOOT FILE NAME?

Enter the name of a file to be created by the generator, or the logical unit number of a device that will output the bootstrap loader that is produced by the generator. The file name entry format is:

```
filename[:security code[:cartridge label]]
```

Enter a zero if no bootstrap loader is to be produced.

> RTE is bootstrapped into memory by a program located on the first two sectors (for 7900/7905/7920/7925 discs) or the first four sectors (for 7906H/7920H/7925H discs) of the System Subchannel (LU2) called the boot extension. The boot extension is responsible for reading a portion of the operating system into memory and starting up the system. There are two ways of loading the boot extension into memory. First, the boot file produced by the generator can be used to activate it. This requires that the boot file be read into memory (via minicartridge, magnetic tape, or paper tape) every time the system is bootstrapped.
>
> The second method of bootstrapping this system uses the disc loader ROM. The ROM is activated via the front panel switches (or the optional RPL feature at power up). If the ROM is used, the generator boot file is not required. The ROM requires the boot extension to be located in specific regions of the disc (disc unit 0, head 0,1,2, or 3, cylinder 0; for RPL-head 0 or 2 only). It therefore restricts the location of the system subchannel. This should be taken into account during the disc planning process. Refer to the RTE-IVB System Manager's Manual for details on disc planning and ROM usage.

Program Input Phase

STEP 16 -- PROG INPUT PHASE:

The generator displays this message to announce the beginning of the Program Input Phase. During this phase commands are entered that direct the entry of modules into the system. (Refer to the example given in Figure 2-4 as you follow the steps in this phase.)

The commands entered in this phase control mapping reports, linkage, symbol table listings, and inform the generator which program files to relocate. Note, however, that the actual relocation is not done during this phase.

Terminate the Program Input Phase by entering the input data terminator, /E.

Program Input Phase Commands

Step 16a -- MAP Command

You use the MAP command to obtain memory mapping information during the relocation process. Maps describing module names and/or entry points, and their boundary addresses may be displayed. Base page linkage information can also be included in the displayed map. The command format is (note that multiple options must be separated by commas):

```
          MODULES
          GLOBALS
MAP       LINKS
          OFF
          ALL
```

where:

MODULES	requests a map of the relocated modules by name
GLOBALS	requests a map of each relocated module's entry points
LINKS	requests a map that reports base page linkage addresses
OFF	disables mapping (turns all mapping display options off)
ALL	requests a report of modules, globals, and links.

If the MAP command is omitted, MAP OFF is assumed by the On-Line Generator.

PROG INPUT PHASE:

(output by generator at start of Program Input Phase)

(generator prompt issued throughout Program and Parameter Input Phases)

(16a) Enter mapping options using the MAP command. This command may be reentered at any time during this phase to change mapping options.

(MAP { MODULES, GLOBALS, LINKS, OFF, ALL } ; may have combinations, separated by commas)

MAP ALL [,.....] optional

(16b) Enter linkage control options using the LINKS IN command. The LINKS IN command may be reentered at any time during this phase to change linkage options.

(LINKS IN { BASE, CURRENT })

LINKS IN CURRENT

(specify BASE or CURRENT)

Figure 2-4. Sample Program Input Phase Worksheet

(16c) Enter the RELOCATE commands (with optional MAP, LINKS IN, and DISPLAY commands)

(REL [(name)] ,filename [: sc [: cartridge label]])

(RT4GN responds with a — after each user input)

REL —, %CR451::SM
REL —, %CR452::SM
REL —, %$CNFX::SM
REL —, %WHZAT::SM
REL —, %9AUTR::SM
REL —, %DVR32::SM
REL —, %DVA32::SM
REL —, %$TA32::SM
REL —, %DVR23::SM
REL —, %DVA05::SM
REL —, %2DV37::SM
REL —, %SRQP::SM
REL —, %DVA12::SM
REL —, %CLIB::SM
REL —, %FF4N::SM
REL —, $MLIB1::SM
REL —, $MLIB2::SM
REL —, $MLIB3::SM

Figure 2-4. Sample Program Input Phase Worksheet (Cont.)

```
(16c) REL -,%DBUGR::SM                              (REL [(name)] ,filename [: sc [: cartridge label] ])
      REL -,$DKULB::SM                              (RT4GN responds with a - after each user input)
                                                    *ICD/MAC Disc Back Up Library
      REL -,$DSCLB::SM                              *ICD/MAC Disc Utility Library
      REL -,%DBKLB::SM                              *7900 Disc Back Up Utility Library
      REL -,%DECAR::SM
      REL -,%HPIB::SM
      REL -,%UTLIB::SM
      REL -,%BAMLIB::SM
      REL -,%BASLB::SM
      REL -,%VLIB::SM
      REL -,%BMPG1::SM
      REL -,%BMPG2::SM
      REL -,%BMPG3::SM
      REL -,%SMON1::SM
      REL -,%SMON2::SM
      REL -,%SPO1B::SM
      REL -,%SPO2B::SM
      REL -,%4LDR::SM
      REL -,%EDITR::SM
```

Figure 2-4. Sample Program Input Phase Worksheet (Cont.)

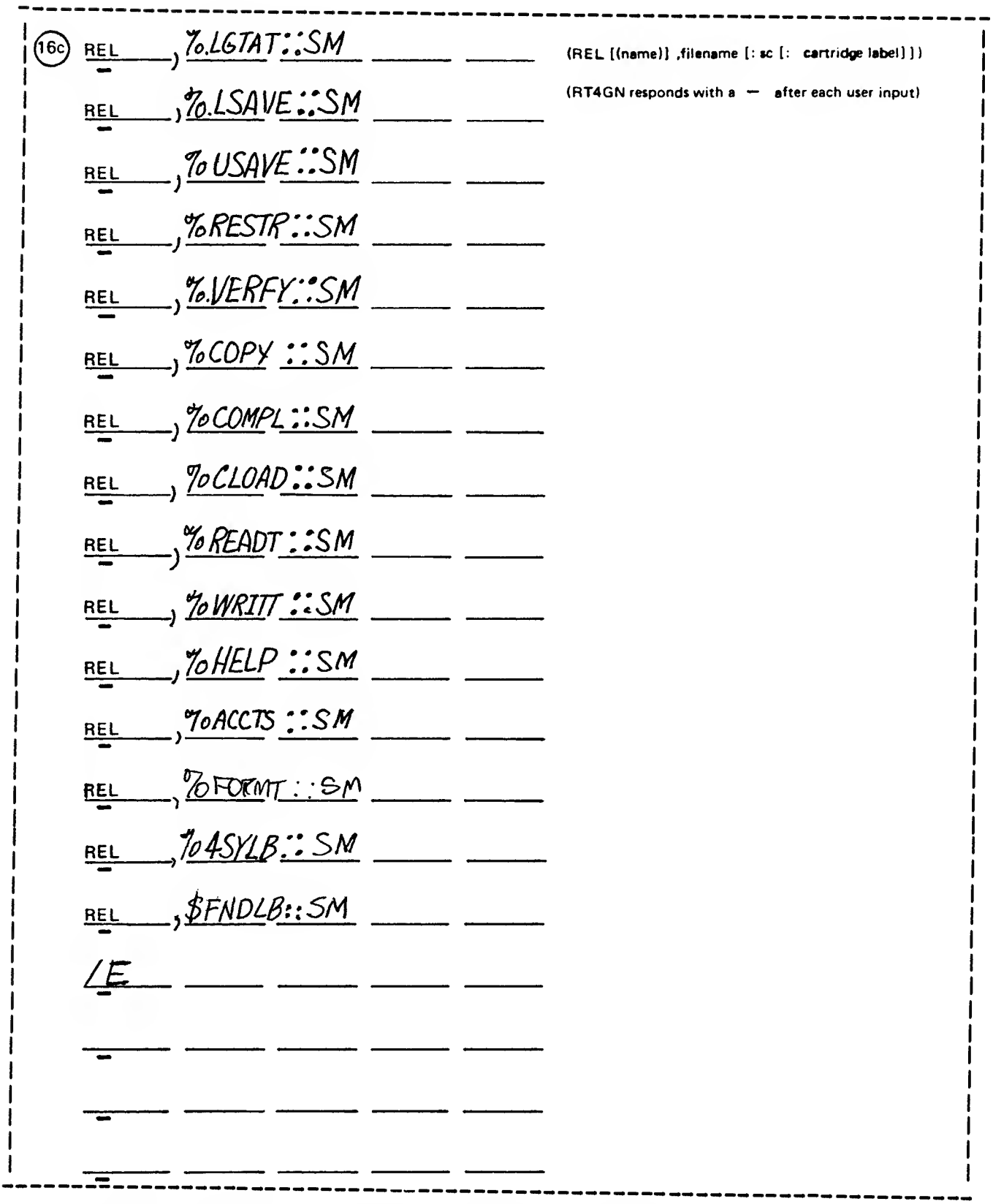


Figure 2-4. Sample Program Input Phase Worksheet (Cont.)

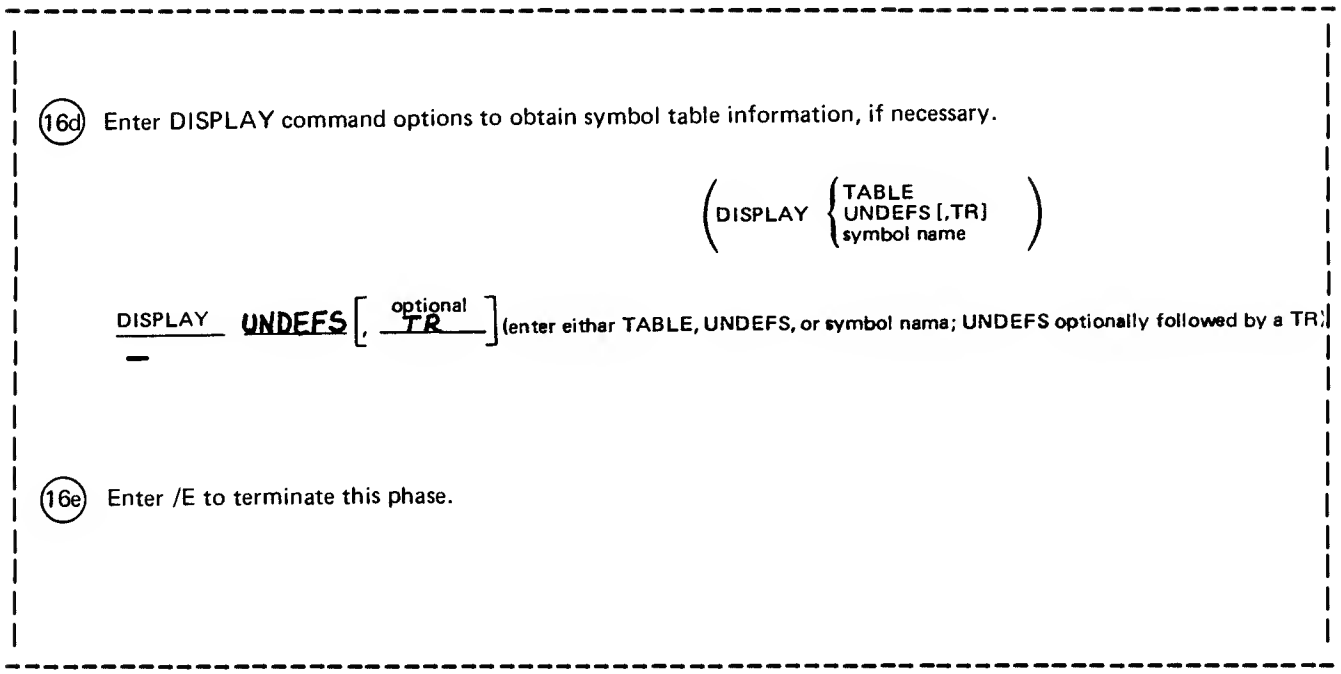


Figure 2-4. Sample Program Input Phase Worksheet (Cont.)

If you enter the MAP command, you must specify at least one of the mapping options. You may specify any combination of options, in any order, separated by commas. (The options specified will be processed from left to right.) For example:

```
MAP MODULES,LINKS
MAP OFF
MAP LINKS,GLOBALS
MAP OFF,MODULES   (disables all options, reenables modules option)
MAP ALL
```

Once invoked, the MAP option remains in effect for all relocatable modules declared in subsequent RELOCATE commands or until it is disabled (MAP OFF). This command may be reentered at any time during the Program Input Phase to change options as desired.

Because the MAP command may be entered at any time during the Program Input Phase to change mapping options, a module appended to another module during relocation may have different mapping options. Generally it is wise to use the MAP ALL option so that this information (which later could be helpful in solving generation problems) will appear in the generation listing.

Step 16b -- LINKS IN Command

You use this command to inform the generator whether linkages are to be via the base page only or via current page and base page. If the LINKS IN CURRENT command is not entered, the generator assumes only base page linkage is to be used. The command format is:

```
LINKS IN    BASE
            CURRENT
```

Once invoked, the LINKS IN command remains in effect for modules specified through subsequent RELOCATE commands. The LINKS IN command may be reentered at any time during the Program Input Phase to change the linkage mode.

Due to the addressing architecture of the HP 1000 Computers, instructions may only directly access data located in the current instruction page or in the program's base page (page 0). To access areas outside these two regions, programs must make use of locations in the current page or base page containing the address of the desired data. These locations are called links. Programs make indirect references through links to access data or instructions outside their directly addressable area. The generator will automatically create links in two circumstances:

- References to external entry points. The generator will automatically create a link for each external entry point referenced in a program (unless it is a DEF to an external with an initial offset, in which case it is direct). These links are always located in the base page.

- References to data/instructions located outside the current page. Since the relocation of programs in memory depends on many factors (e.g., program type, size, common, etc.) it would be very difficult for a program to make provisions for linking and still make efficient use of memory. Therefore, the generator does this automatically by allocating a link whenever an instruction makes a direct reference outside the current page.

In all cases where links are generated, the referencing instruction is modified to make an indirect reference through the link. Since references to external entry points always use base page links, the LINKS IN command effects the second type of reference described above. An example of base page linking (LINKS IN BASE) is shown in Figure 2-5. In this example, two instructions reference areas outside their pages. When the generator detects this condition, it will allocate base page links and modify

the instructions to use the links.

An example of current page linking (LINKS IN CURRENT) is shown in Figure 2-6. Here links are allocated in the same page as the reference instruction. Current page links are allocated in two areas: immediately preceeding the program and immediately following the program.

The LINKS IN CURRENT command is used to reduce the number of base page links and consequently to conserve available words on the base page. Links are put in current page only on the first and last pages of a module. Program page crossings may cause indirect links to be generated on the base page if there are no current page link areas in the same page as the reference instruction.

The LINKS IN CURRENT command will probably be the option used most frequently. The LINKS IN BASE command is generally used only when memory space is critical, or when you need to reduce program size by a minimal number of words; (e.g., if a program is slightly too large for the partition in which you want it to run).

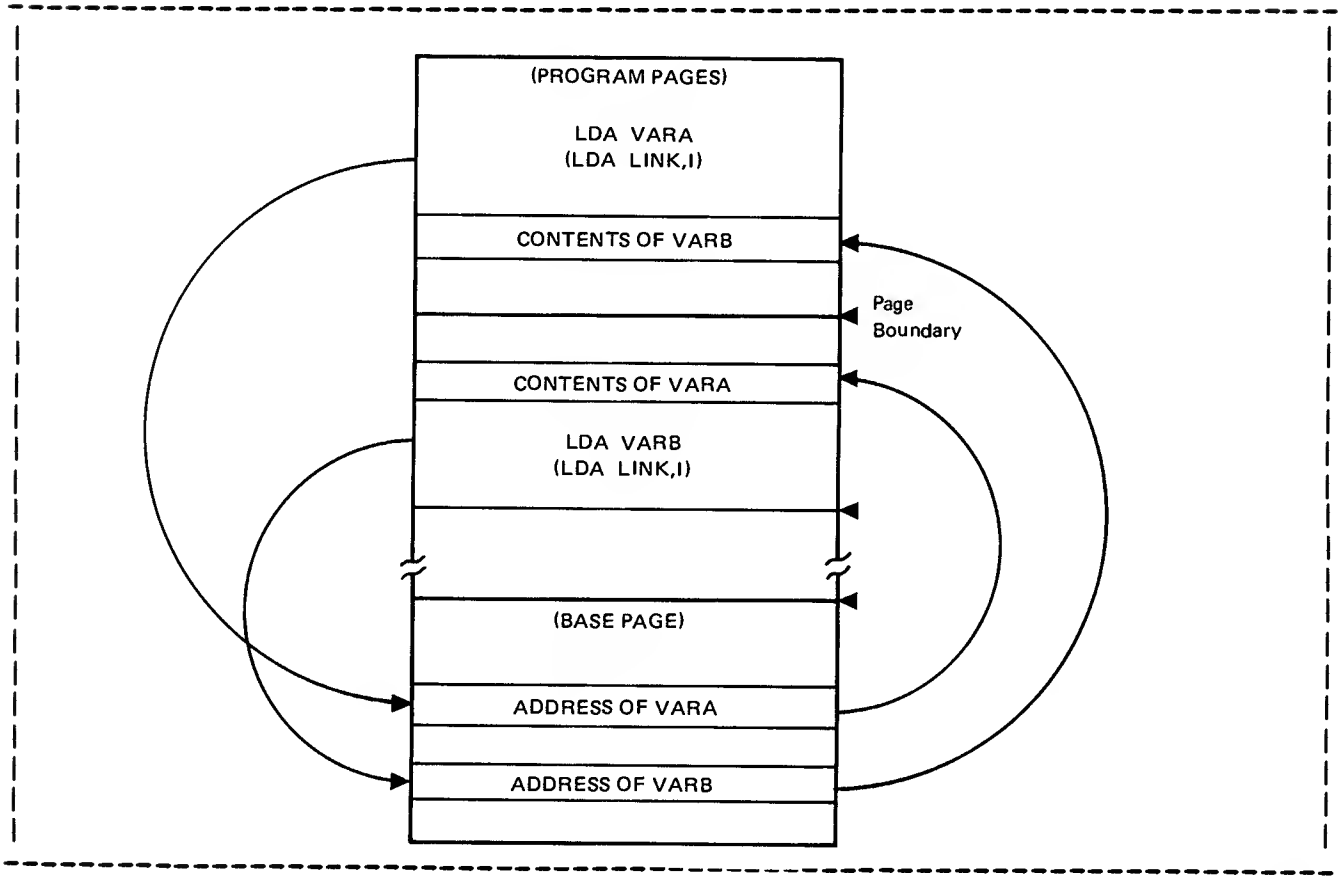


Figure 2-5. Base Page Linking

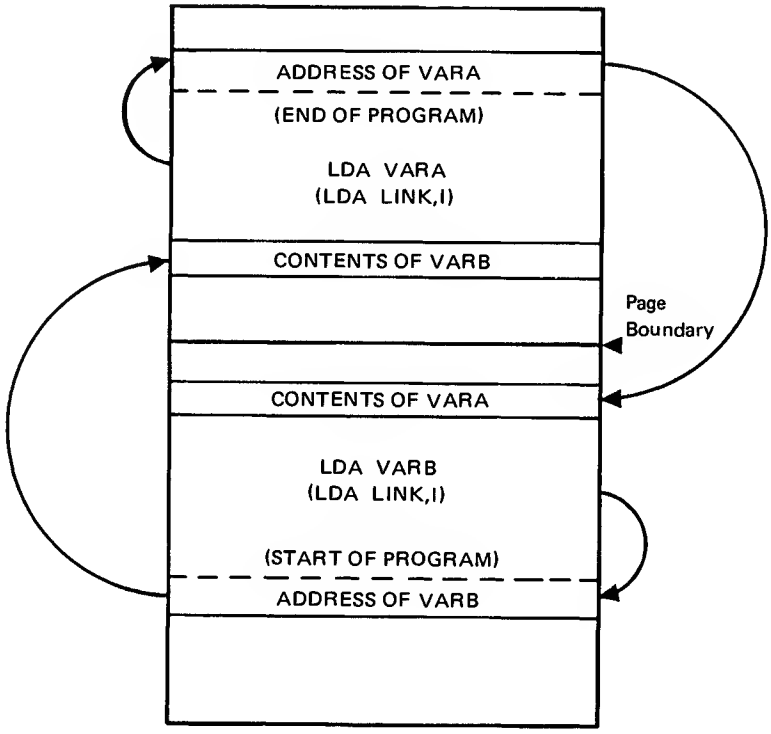


Figure 2-6. Current Page Linking

Step 16c -- RELOCATE Command

Enter the RELOCATE command to specify which modules are to be included in the generation. The command format is (note that a comma must always precede the filename):

```
RELOCATE [(name)],filename
```

or,

```
REL [(name)],filename
```

where:

(name) is the program name of a specific module to be relocated. The name must be enclosed in parentheses. This is an optional parameter; if it is omitted, the entire contents of the file are relocated.

filename is the name of the file that contains the module or modules to be relocated. The filename entry format is:

filename[:security code[:cartridge label]]

The RELOCATE command directs the generator to read and unconditionally relocate program modules (during the Program Loading Phase).

If name is omitted, all modules in the file specified by filename are relocated.

If name is specified, all other modules in the named file are ignored; i.e., preceding modules in the file are skipped, and the file scan terminates following relocation of the named module.

When you use the RELOCATE command, the specification of a main program module must precede that of the program's segments.

The order that modules are specified during the relocation phase can effect the order that modules are relocated in the system. You can arrange the order of modules to perform the following optimizations:

- Reduce Memory Resident Links. Memory resident programs are relocated by the generator in the same order that their relocatable modules are specified to the generator. By reordering these modules, it may be possible to have fewer programs cross page boundaries and thereby reduce the number of links created. This will be most useful in situations where memory resident program space is very limited or the total memory resident program area just slightly exceeds a page boundary (thereby wasting most of the last page).

- Reduce the number of driver partitions. The generator attempts to optimize the relocation of drivers into driver partitions. After the first driver is relocated into a partition, a scan is made down the list of remaining unrelocated drivers for a driver that will fit into the remainder of the partition. This process is repeated until a driver small enough to fit into the remaining driver partition space can not be found. When this occurs, the generator will allocate a new partition to contain the remaining drivers.

  When searching for a driver to fill a driver partition, the generator takes the first driver in the list that will fit. This may not be the best fit. You can control the order that drivers are searched by ordering them the intended way during the relocation phase. Basically, you want to order your drivers such that by grouping them to fill

driver partitions, you get the fewest number of groups.

- Reduce library search time. The order that library routines are specified during the relocation phase will effect their position in the disc resident library. To reduce library search time for on-line loads, frequently accessed library modules should be placed as close to the start of the disc resident library as possible. Since modules in the relocatable library are normally accessed more often than those in the system library. It is suggested that the former be specified first during the relocation phase.

Step 16d -- DISPLAY Command

You can invoke the DISPLAY command to list, on the user's console and the list file, the contents of the symbol table, the names of undefined external symbols, or the presence of a specific symbol. The DISPLAY command format is:

```
          TABLE
DISPLAY UNDEFS[,TR]
          symbol name
```

where:

TABLE — requests a list of the entry points contained in the symbol table.

UNDEFS[,TR] — requests a list of any undefined symbols (unresolved external references). TR is an optional parameter (only used with the UNDEFS option) that allows a transfer to the user console if any undefined symbols exist; otherwise, the generator proceeds.

symbol name — requests the generator to search the symbol table for a specific symbol. "UNDEFINED" is printed if the symbol is not found.

If you enter a DISPLAY UNDEFS,TR command before exiting from the Program Input Phase, you will have the opportunity to satisfy, through modules specified in additional RELOCATE commands, any undefined externals that may exist.

NOTE

The generator automatically lists all undefined symbols (in the list file only) after exiting from the Program Input Phase. These symbols remain undefined unless changed during the CHANGE ENT'S phase. During program relocation, all instructions referencing undefined symbols will be replaced with a NOP (no operation).

If you generate %BASLB into your system but are not using the HP6940 Multiprogrammer Subsystem, then the symbol &6940 will be listed as undefined here. This is not an error and therefore no action is required to correct it.

Parameter Input Phase

STEP 17 -- PARAMETERS

This message announces the beginning of the Parameter Input Phase.

During this phase you can modify the type, priority, and execution interval, or the ENT (entry) record of any of the programs specified during the Program Input Phase. The original type, priority, and execution interval of each program was specified at the beginning of its source code. (Refer to the example given in Figure 2-7 as you follow the steps in this phase.) Refer to Appendix B for a discussion of the RTE-IVB memory configuration and the various components that comprise the system.

Enter the parameter string in the following general form:

```
name,type[,priority[,execution interval]]
```

where:

name is the name of the program.

type
- 0 -- system program or driver.
- 1 -- memory resident.
- 2 -- real-time disc resident.
- 3 -- background disc resident.
- 4 -- background disc resident without Table Area II access.
- 5 -- program segment (RT or BG).
- 6 -- library, reentrant or privileged subroutines (note that if called by a memory resident program, these routines are relocated into the Memory Resident Library. Aside from memory resident loading they are treated as Type 7.).
- 7 -- library, utility subroutines (appended to calling program and stored in the relocatable library of the disc).

8 -- if program is a main, it is deleted from the system,

or,

if program is a subroutine, it is used to satisfy any external references during generation; however, it is not stored in the relocatable library area of the disc.

13 -- (Table Area II) system entry points that contain pointers and system values that are defined at generation. Table Area II is a combination of these relocated Type 13 modules and system tables that are built by the generator.

14 -- same as Type 6, but automatically included in the Memory Resident Library. Aside from memory resident loading, they are treated as Type 7.

15 -- (Table Area I) system entry points that must be included in the system and user maps. Table Area I is a combination of these relocated Type 15 modules and I/O tables that are built by the generator.

30 -- Subsystem Global Area (SSGA).

NOTE

In some cases the primary type code (i.e., 1, 2, 3, 4) may be expanded by adding 8, 16, 24, or 128 to the number. These expanded types allow such features as: access to real-time COMMON by background programs, access to SSGA, and a do not duplicate indicator. See Table 2-1 for a summary of program types.

The primary type code of a main program and its segments must not be changed because the relationship between the program and its segments would be lost.

priority is the program priority in the range of 1 through 32767 (1 is the highest priority).

Parameter Input Phase

(modify type, priority, and execution interval, or the ENT (entry) record of any of the programs specified during the Program Input Phase)

(17) PARAMETERS (output by generator at start of Parameter Input Phase)

(generator prompt)

D.RTR , 1 , 1 , _____ (name, Type [,priority [,execution interval]])

WHZAT , 1 , 41 , _____

(terminate your final entry with a /E)

/E , _____ , _____ , _____

Figure 2-7. Sample Parameter Input Phase Worksheet

(18) CHANGE ENTS? (change/create entry points?)

— (generator prompt)

TAN , RP , 105320 (entry, type - AB or RP, value)

—

SQRT , RP , 105321 (terminate your final entry with a /E)

—

ALOG , RP , 105322

—

ATAN , RP , 105323

—

COS , RP , 105324

—

SIN , RP , 105325

—

EXP , RP , 105326

—

ALOGT , RP , 105327

—

TANH , RP , 105330

—

TRNL , RP , 105331

—

/CMRT , RP , 105332

—

/ATLG , RP , 105333

—

.FPWR , RP , 105334

—

.TPWR , RP , 105335

—

.DAD , RP , 105014

—

.DSB , RP , 105034

—

.DMP , RP , 105054

—

.DDI , RP , 105074

—

.DSBR , RP , 1050114

Figure 2-7. Sample Parameter Input Phase Worksheet (Cont.)

(18) .DDIR , RP , 105134 (change/create entry points?)

(generator prompt)

.DNG , RP , 105203 (entry, type - AB or RP, value)

.DIN , RP , 105210 (terminate your final entry with a /E)

.DDE , RP , 105211

.DIS , RP , 105212

.DDS , RP , 105213

.DCO , RP , 105204

DBLE , RP , 105201

SNGL , RP , 105202

.DFER , RP , 105205

.XPAK , RP , 105206

.BLE , RP , 105207

.NGL , RP , 105214

.XCOM , RP , 105216

..DCM , RP , 105216

DDINT , RP , 105217

.XFER , RP , 105220

.GOTO , RP , 105221

..MAP , RP , 105222

.ENTR , RP , 105223

Figure 2-7. Sample Parameter Input Phase Worksheet (Cont.)

(18) •ENTP , RP , 105224 (change/create entry points?)

(generator prompt)

•PWR2 , RP , 105225 (entry, type - AB or RP, value)

•FLUN , RP , 105226 (terminate your final entry with a /E)

$SETP , RP , 105227

•PACK , RP , 105230

•CFER , RP , 105231

••FCM , RP , 105232

••ICM , RP , 105233

•LBT , RP , 105763

•SBT , RP , 105764

•DLD , RP , 104200

•DST , RP , 104400

•MPY , RP , 100200

•DIV , RP , 100400

CLRIO , RP , 2001

•FAD , RP , 105000

•FSB , RP , 105020

•FMP , RP , 105040

•FDV , RP , 105060

IFIX , RP , 105100

Figure 2-7. Sample Parameter Input Phase Worksheet (Cont.)

(18) .FIXD , RP , 105104 (change/create entry points?)

— (generator prompt)

FLOAT , RP , 105120 (entry, type - AB or RP, value)

—

.FLTD , RP , 105124 (terminate your final entry with a /E)

—

.XADD , RP , 105001

—

.XSUB , RP , 105021

—

.XMPY , RP , 105041

—

.XDIV , RP , 105061

—

.XFXS , RP , 105101

—

.DINT , RP , 105101

—

.XFXD , RP , 105105

—

.XFTS , RP , 105121

—

.IDBL , RP , 105121

—

.XFTD , RP , 105125

—

.TADD , RP , 105002

—

.TSUB , RP , 105022

—

.TMPY , RP , 105042

—

.TDIV , RP , 105062

—

.TFXS , RP , 105102

—

.TINT , RP , 105102

—

.TFXD , RP , 105106

Figure 2-7. Sample Parameter Input Phase Worksheet (Cont.)

```
(18) .TFTS , RP , 105122          (change/create entry points?)
-                                 (generator prompt)
.ITBL , RP , 105122               (entry, type - AB or RP, value)
-
.TFTD , RP , 105126               (terminate your final entry with a /E)
-
.EMAP , RP , 105257
-
.EMIO , RP , 105240
-
MMAP , RP , 105241
-
.MVW , RP , 105777
-
.CMW , RP , 105776
-
Z$DBL , RP , 4
-
.VECT , RP , 101460
-
VPIV , RP , 101461
-
VABS , RP , 101462
-
VSUM , RP , 101463
-
VNRM , RP , 101464
-
VDOT , RP , 101465
-
VMAX , RP , 101466
-
VMAB , RP , 101467
-
VMIN , RP , 101470
-
VMIB , RP , 101471
-
VMOV , RP , 101472
```

Figure 2-7. Sample Parameter Input Phase Worksheet (Cont.)

```
(18) VSWP , RP , 101473
—
.ERES , RP , 101474
—
.ESEG , RP , 101475
—
.VSET , RP , 101476
—
.DVCT , RP , 105460
—
DVPIV , RP , 105461
—
DVABS , RP , 105462
—
DVSUM , RP , 105463
—
DVNRM , RP , 105464
—
DVDOT , RP , 105465
—
DVMAX , RP , 105466
—
DVMAB , RP , 105467
—
DVMIN , RP , 105470
—
DVMIB , RP , 105471
—
DVMOV , RP , 105472
—
DVSWP , RP , 105473
—
/E
```

(change/create entry points?)

(generator prompt)

(entry, type - AB or RP, value)

(terminate your final entry with a /E)

Figure 2-7. Sample Parameter Input Phase Worksheet (Cont.)

execution interval — is a list of six parameters specifying the times the program should be scheduled for execution once it is turned on. The first two values (decimal) specify the execution interval, and the last four (decimal) specify an initial absolute starting time. The parameters are:

[res[,mult[,hour,min,sec,10msec]]]

res — resolution code (0 to 4):

0 -- no execution interval
1 -- tens of milliseconds
2 -- seconds
3 -- minutes
4 -- hours

mult — execution interval multiple (0 to 4095); an integer that specifies the time interval between program runs. 0 indicates that the program is to run once.

Initial Absolute Starting Time (four values):

hour, — hours (0 to 23)
min, — minutes (0 to 59)
sec, — seconds (0 to 59)
10msec — tens of milliseconds (0 to 99).

The generator has an additional feature that applies to memory and disc resident programs. During the Parameter Input Phase, one program can be scheduled to execute automatically whenever the RTE system is booted up from the system disc. This is accomplished by adding the value 80 to the program's type code. For example, if PROG is originally a Type 2 program (real-time disc resident), it can be changed to:

```
PROG,82
```

This entry will cause PROG to be automatically scheduled each time the system is booted up from the disc and after the File Manager has been scheduled. If more than one program is assigned for automatic scheduling, only the last one entered will be recognized.

It is also possible to disable the File Manager's automatic program renaming feature. (See the RTE-IVB Programmer's Reference Manual for a discussion of program renaming under the File Manager). If the value 128 is added to PROG's type code, PROG will never be renamed when executed. (No duplication). Thus PROG will never be renamed to PROXX (where XX is the terminal's system lu) when run. Terminate the parameter entry list using the input data terminator, /E.

Table 2-1. Summary of RTE-IVB Program Types

PROGRAM CATEGORY / EXECUTABLE PROGRAMS	PROGRAM TYPE	COMMON ACCESS: REAL-TIME COMMON	BACKGROUND COMMON	SSGA	RT COMMON & SSGA	BG COMMON & SSGA	EMA ALLOWED	LOAD POINT: NO COMMON DECLARED	SOME COMMON DECLARED	MEMORY PROTECT FENCE: NO COMMON DECLARED	SOME COMMON DECLARED
MEMORY RESIDENT*	1	√						L_1	L_1	F_5	F_3
	9		√					L_1	L_1	F_5	F_4
	17			√				L_1	L_4	F_1	F_1
	17				√			L_1	L_4	F_1	F_1
	25					√		L_1	L_1	F_1	F_1
REAL TIME DISC RESIDENT*††	2	√					√	L_4	L_4	F_6	F_3
	10		√				√	L_4	L_4	F_6	F_4
	18			√			√	L_1	L_4	F_1	F_1
	18				√		√	L_1	L_4	F_1	F_1
	26					√	√	L_4	F_4	F_1	F_1
BACKGROUND DISC RESIDENT*††	3		√				√	L_4	L_1	F_6	F_4
	11	√					√	L_4	L_4	F_6	F_3
	19			√			√	L_4	L_4	F_1	F_1
	19					√	√	L_4	L_4	F_1	F_1
	27				√		√	L_4	L_4	F_1	F_1
BACKGROUND DISC RESIDENT WITHOUT TABLE AREA II ACCESS*††	4		√				√	L_3	L_2	F_2	L_4
	17	√					√	L_3	L_2	F_2	F_3
	20			√			√	L_2	L_2	F_1	F_1
	20					√	√	L_2	L_2	F_1	F_1
	28				√		√	L_2	L_2	F_1	F_1

*ADD 80 TO ANY OF THESE TYPES TO SPECIFY AUTOMATIC SCHEDULING AT SYSTEM STARTUP.

†† ADD 128 TO ANY OF THESE TYPES TO SPECIFY THAT THE PROGRAM CANNOT BE DUPLICATED.

Table 2-1. Summary of RTE-IVB Program Types (Cont.)

SPECIAL PROGRAMS	TYPE	DESCRIPTION
SYSTEM MODULE	0	MODULE TO BE LOADED WITH RESIDENT SYSTEM. PART OF HP-SUPPLIED SYSTEM, USER-WRITTEN DRIVER, ETC.
PROGRAM SEGMENT	5	OVERLAYABLE MODULE USED WITH DISC RESIDENT MAIN. COMMON TYPE, MEMORY-PROTECT FENCE ADDR. AND LOAD PT. DETERMINED BY MAIN.
SUBROUTINE	6	RELOCATED INTO RESIDENT LIBRARY IF CALLED BY ANY MEMORY RESIDENT PROGRAM (ALWAYS BECOME 7'S).
SUBROUTINE	7	STORED ON DISC IN RELOCATABLE FORM. ANY PROGRAM CALLING A TYPE 7 HAS A COPY APPENDED TO IT.
SUBROUTINE	8	APPENDED TO CALLING PROGRAM. ALL TYPE 8 RELOCATABLES ARE DISCARDED AFTER GENERATION.
TABLE AREA II	13	MODULE TO BE LOADED WITH RESIDENT SYSTEM IN TABLE AREA II. PART OF HP-SUPPLIED SYSTEM, USER-WRITTEN TABLES, ETC.
SUBROUTINE	14	RELOCATED INTO RESIDENT LIBRARY, WHETHER CALLED OR NOT (ALWAYS BECOME TYPE 7).
TABLE AREA I	15	MODULE TO BE LOADED WITH RESIDENT SYSTEM IN TABLE AREA I. PART OF HP-SUPPLIED SYSTEM, USER-WRITTEN TABLES, ETC.
SSGA MODULE	30	RELOCATED INTO SUBSYSTEM GLOBAL AREA OF SYSTEM. ACCESSIBLE ONLY TO PROGRAMS OF PROPER TYPE (ABOVE).

LOAD POINT & FENCE DEFINITIONS (SEE FIGURES 2-12 AND B-2)

L_1 – NEXT AVAILABLE LOCATION DURING LOAD OF RESIDENTS PLUS 2

L_2 – 35TH WORD OF NEXT PAGE AFTER COMMON AREAS

L_3 – 35TH WORD OF NEXT PAGE AFTER DRIVER PARTITION

L_4 – 35TH WORD OF NEXT PAGE AFTER TABLE AREA II

F_1 – FIRST WORD OF SSGA

F_2 – FIRST WORD OF PAGE FOLLOWING DRIVER PARTITION

F_3 – FIRST WORD OF RT COMMON

F_4 – FIRST WORD OF BG COMMON

F_5 – FIRST WORD OF RESIDENT PROGRAM AREA

F_6 – FIRST WORD OF PAGE FOLLOWING TABLE AREA II

STEP 18 -- CHANGE ENTS?

When the generator outputs this query, you can enter your changes to the ENT records. Type 3 (absolute) and Type 4 (replace) ENT records can be created and/or modified. Enter your changes in the following form:

```
entry,type,value
```

where:

entry is the entry point name

type is the entry point type; AB = absolute, RP = replace

value is the entry point instruction value. Octal numbers are assumed unless the letter "D" (denotes decimal) follows the number.

When an entry point is redefined to the absolute (AB) type, the address of that entry point will be replaced by the absolute value declared. All instructions that reference this entry point will use the new absolute address specified.

For example:

```
UDEV1,AB,30
```

Will declare entry point UDEV1 absolute with a value of 30 octal. This implies that the instruction OTA UDEV1 will be replaced with OTA 30.

When an entry point is redefined to the replace type = RP, the loader will replace each reference to it with the number declared in the value parameter. You can then create Type 4 entry records that are microcode replacement values. Then, a JSB instruction referencing an external entry point is intercepted by the RTE Loader and RT4GN and changed to a value that has been defined by the RP command. This allows the elimination of software subroutines by replacing subroutine entry points with microcode instructions.

For example:

```
.FMP,RP,105040
```

causes each JSB .FMP instruction (floating point multiply) to be changed to the microcode floating point multiply instruction (105040).

The value of an EMA common block entry point cannot be modified.

The microcode replacement values to be generated into the system will depend on your hardware configuration. Refer to the RTE-IVB System Manager's Manual and other appropriate manuals for information regarding optional HP microcode routines and RP values.

Table Generation Phase

Required system tables, including the Equipment Table (EQT), the Device Reference Table (DRT), and the Interrupt Table (INT) are built during the Table Generation Phase. Relocation begins with the Table Area I modules. (Refer to the example given in Figure 2-8 as you follow the steps in this phase.)

```
STEP 19 -- TABLE AREA I  <<PAGE XXXXX>>:
           EQUIPMENT TABLE ENTRY
```

These messages, along with a report of the starting physical page number, begin the Table Generation Phase. They are followed by a prompt that requests input for the first EQT entry:

```
EQT 01?
```

Respond with EQT entry number one in the form:

```
select code,driver[,B][,D][,S][,M][,T=ttttt][,X=xxx]
```

where:

select code	is the octal select code number (I/O slot)
driver	is the driver name and number in the form DVynn; e.g., DVR32
B	may be specified to enable automatic output buffering for output requests
D	may be specified to request direct memory access (DCPC channel required by driver)
S	may be specified to force driver into the System Driver Area
M	may be specified to force driver into the System Driver Area and declare that it is to do its own mapping
T=ttttt	may be specified to declare a time-out interval for device interrupt (ttttt represents tens of milliseconds in the range of 1-32767)
X=xxx	may be specified to declare an extended EQT entry (xxx represents the number of words to extend the entry in the range of 1-999).

(Refer to the individual driver manuals for more information regarding buffering, time-out, etc.)

TABLE AREA I ≪PAGE XXXXX≫ :

(output by generator at start of Table Generation Phase)

(19) EQUIPMENT TABLE ENTRY

(oct. select code, driver [,B] [,D] [,S] [,M] [,T = ttttt] [,X = xxx])

(do not specify SDA for system disc driver)

(terminate your final entry with a /E)

EQT 01?
11, DVR32, D

EQT 02?
12, DVA32, D, T=100

EQT 03?
13, DVA05, B, X=13, T=12000

EQT 04?
14, DVA12, B, T=300

EQT 05?
15, DVR37, B, X=50, T=20000

EQT 06?
16, DVR23, B, D

EQT 07?
20, DVA05, B, X=13, T=12000

EQT 08?
21, DVA05, B, X=13, T=12000

EQT 09?
22, DVA05, B, X=13, T=12000

EQT 10?
23, DVA05, B, X=13, T=12000

EQT 11?
24, DVA05, B, X=13, T=12000

EQT 12?
25, DVA05, B, X=13, T=12000

EQT 13?
26, DVA05, B, X=13, T=12000

EQT 14?
70, DVS43, M, X=18

EQT 15?
71, DVS43, M, X=18

EQT 16?
72, DVS43, M, X=18

EQT 17?
73, DVS43, M, X=18

EQT 18?
74, DVS43, M, X=18

EQT 19?
75, DVS43, M, X=18

Figure 2-8. Sample Table Generation Phase Worksheet

(19) Equipment Table Entry (Continued)

EQT 20?
76, DVS43, M, X=18, , , , ,

EQT 21?
77, DVS43, M, X=18, , , , ,

EQT 22?
4, DVP43, M, , , , , ,

EQT 23?
/E
, , , , , , , ,

EQT 24?
, , , , , , , ,

EQT 25?
, , , , , , , ,

EQT 26?
, , , , , , , ,

EQT 27?
, , , , , , , ,

EQT 28?
, , , , , , , ,

EQT 29?
, , , , , , , ,

EQT 30?
, , , , , , , ,

EQT 31?
, , , , , , , ,

EQT 32?
, , , , , , , ,

EQT 33?
, , , , , , , ,

EQT 34?
, , , , , , , ,

EQT 35?
, , , , , , , ,

EQT 36?
, , , , , , , ,

EQT 37?
, , , , , , , ,

EQT 38?
, , , , , , , ,

EQT 39?
, , , , , , , ,

Figure 2-8. Sample Table Generation Phase Worksheet (Cont.)

(20) DEVICE REFERENCE TABLE

(LU1 = EQT #?)

(eqt entry, optional subchannel; the subchannel # should match the response in Step (6))

(terminate your final entry with a /E)

(number should match response to Step (7a), if entered)

(system console)	001 = EQT #?	3 ,
(system disc)	002 = EQT #?	1 ,
(auxiliary disc)	003 = EQT #?	1 , 14
(standard output)	004 = EQT #?	3 , 1
(standard input)	005 = EQT #?	3 , 2
(standard list)	006 = EQT #?	4 ,
	007 = EQT #?	5 ,
(mag. tape)	008 = EQT #?	6 ,
	009 = EQT #?	1 , 1
	010 = EQT #?	1 , 2
	011 = EQT #?	1 , 3
	012 = EQT #?	1 , 4
	013 = EQT #?	1 , 5
	014 = EQT #?	1 , 6
	015 = EQT #?	1 , 7
	016 = EQT #?	1 , 8
	017 = EQT #?	1 , 9
	018 = EQT #?	1 , 10
	019 = EQT #?	1 , 11
	020 = EQT #?	1 , 12

Figure 2-8. Sample Table Generation Phase Worksheet (Cont.)

(20) Device Reference Table (Continued)

021 = EQT # ? 1, 13	041 = EQT # ? 2, 3	061 = EQT # ? 2, 23
022 = EQT # ? 1, 15	042 = EQT # ? 2, 4	062 = EQT # ? 2, 24
023 = EQT # ? 1, 16	043 = EQT # ? 2, 5	063 = EQT # ? 2, 25
024 = EQT # ? 1, 17	044 = EQT # ? 2, 6	064 = EQT # ? 2, 26
025 = EQT # ? 1, 18	045 = EQT # ? 2, 7	065 = EQT # ? 2, 27
026 = EQT # ? 1, 19	046 = EQT # ? 2, 8	066 = EQT # ? 2, 28
027 = EQT # ? 1, 20	047 = EQT # ? 2, 9	067 = EQT # ? 2, 29
028 = EQT # ? 1, 21	048 = EQT # ? 2, 10	068 = EQT # ? 2, 30
029 = EQT # ? 1, 22	049 = EQT # ? 2, 11	069 = EQT # ? 2, 31
030 = EQT # ? 1, 23	050 = EQT # ? 2, 12	070 = EQT # ? 22,
031 = EQT # ? 1, 24	051 = EQT # ? 2, 13	071 = EQT # ? 7,
032 = EQT # ? 1, 25	052 = EQT # ? 2, 14	072 = EQT # ? 8,
033 = EQT # ? 1, 26	053 = EQT # ? 2, 15	073 = EQT # ? 9,
034 = EQT # ? 1, 27	054 = EQT # ? 2, 16	074 = EQT # ? 10,
035 = EQT # ? 1, 28	055 = EQT # ? 2, 17	075 = EQT # ? 11,
036 = EQT # ? 1, 29	056 = EQT # ? 2, 18	076 = EQT # ? 12,
037 = EQT # ? 1, 30	057 = EQT # ? 2, 19	077 = EQT # ? 13,
038 = EQT # ? 1, 31	058 = EQT # ? 2, 20	078 = EQT # ? 7, 1
039 = EQT # ? 2, 1	059 = EQT # ? 2, 21	079 = EQT # ? 7, 2
040 = EQT # ? 2, 2	060 = EQT # ? 2, 22	080 = EQT # ? 7, 4

Figure 2-8. Sample Table Generation Phase Worksheet (Cont.)

(20) Device Reference Table (Continued)

081 = EQT # ? 8, 1	101 = EQT # ? 13, 4	121 = EQT # ? ,
082 = EQT # ? 8, 2	102 = EQT # ? 14,	122 = EQT # ? ,
083 = EQT # ? 8, 4	103 = EQT # ? 15,	123 = EQT # ? ,
084 = EQT # ? 9, 1	104 = EQT # ? 16,	124 = EQT # ? ,
085 = EQT # ? 9, 2	105 = EQT # ? 17,	125 = EQT # ? ,
086 = EQT # ? 9, 4	106 = EQT # ? 18,	126 = EQT # ? ,
087 = EQT # ? 10, 1	107 = EQT # ? 19,	127 = EQT # ? ,
088 = EQT # ? 10, 2	108 = EQT # ? 20,	128 = EQT # ? ,
089 = EQT # ? 10, 4	109 = EQT # ? 21,	129 = EQT # ? ,
090 = EQT # ? 11, 1	110 = EQT # ? 1E,	130 = EQT # ? ,
091 = EQT # ? 11, 2	111 = EQT # ? ,	131 = EQT # ? ,
092 = EQT # ? 11, 3	112 = EQT # ? ,	132 = EQT # ? ,
093 = EQT # ? 11, 4	113 = EQT # ? ,	133 = EQT # ? ,
094 = EQT # ? 12, 1	114 = EQT # ? ,	134 = EQT # ? ,
095 = EQT # ? 12, 2	115 = EQT # ? ,	135 = EQT # ? ,
096 = EQT # ? 12, 3	116 = EQT # ? ,	136 = EQT # ? ,
097 = EQT # ? 12, 4	117 = EQT # ? ,	137 = EQT # ? ,
098 = EQT # ? 13, 1	118 = EQT # ? ,	138 = EQT # ? ,
099 = EQT # ? 13, 2	119 = EQT # ? ,	139 = EQT # ? ,
100 = EQT # ? 13, 3	120 = EQT # ? ,	140 = EQT # ? ,

Figure 2-8. Sample Table Generation Phase Worksheet (Cont.)

(21) INTERRUPT TABLE

(enter octal select codes in ascending order)

(generator prompt)

(select code, option, destination)

(terminate your final entry with a /E)

```
-4,ENT,$POWR
-11,EQT,1
-12,EQT,2
-13,PRG,PRMPT
-14,EQT,4
-15,EQT,5
-16,EQT,6
-17,EQT,6
-20,PRG,PRMPT
-21,PRG,PRMPT
-22,PRG,PRMPT
-23,PRG,PRMPT
-24,PRG,PRMPT
-25,PRG,PRMPT
-26,PRG,PRMPT
-70,EQT,13
-71,EQT,14
-72,EQT,15
-73,EQT,16
```

Figure 2-8. Sample Table Generation Phase Worksheet (Cont.)

(21) Interrupt Table (Continued)

(enter octal select codes in ascending order)

(generator prompt)

(select code, option, destination)

(terminate your final entry with a /E)

```
-
74,EQT,17
-
75,EQT,18
-
76,EQT,19
-
77,EQT,20
-
/E
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
-
,,
```

Figure 2-8. Sample Table Generation Phase Worksheet (Cont.)

EQT entry 01 should be for the system disc. A typical EQT entry for the HP 7925 disc is:

```
11,DVR32,D
```

Once you respond to the request for EQT entry 01, the prompt is incremented by one and repeated:

```
EQT 02?
```

Each time you respond, the prompt is incremented by one and redisplayed. A maximum of 63 EQT entries may be defined.

Terminate the EQT Table Entry using the input data terminator, /E.

Eacn EQT entry on the worksheet contains a blank for the driver name which contains five characters, starts with the characters "DV" and ends with a two-digit octal number (i.e., DVynn).

The remaining blanks on the EQT entry line are for D (DCPC required), B (buffered output), S (System Driver Area), M (System Driver Area with mapping), T (time-out), and X (extended EQT). The blanks are filled in as shown in the example in Figure 2-9. EQT parameter specifications are dependent upon driver and device requirements. With the possible exception of the B and T parameters, EQT specifications should be taken directly from the appropriate driver manuals, subsystem configuration guides, and the System Manager's Manual.

If B is specified, automatic output buffering will be enabled for the device. The operating system will copy into a system buffer data that is to be output to a device. This will allow program processing to proceed currently with output requests (rather than suspending the program while it waits for a buffer in the program to be emptied).

If D is specified for a device, then the system will allocate a DCPC channel for the device whenever an I/O request is made to the device.

If S is specified, then the associated driver will be relocated into the System Driver Area. If M is specified, then the associated driver will be relocated into the System Driver Area, and the driver will do its own mapping. For drivers declared in more than one EQT, the S and/or M options must be identical. All drivers with neither S nor M specified will be relocated into the Driver Partition Area. Drivers without EQT'S will be relocated with the Type 0 system modules. Do not specify M or S for the disc driver.

NOTE

> Unbuffered drivers not doing their own mapping should not be forced into the System Driver Area if they are to be used by Type 4 background programs.

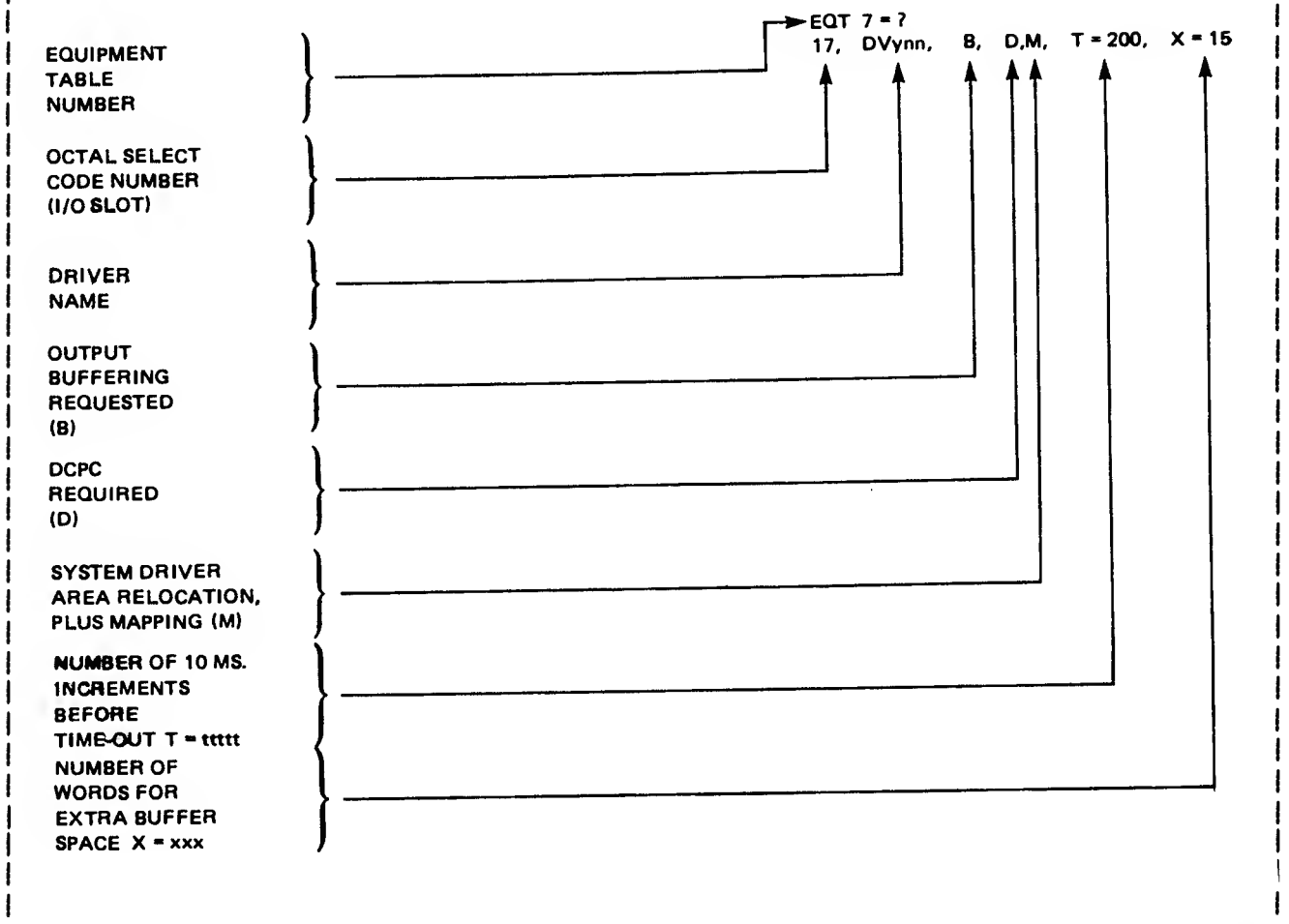


Figure 2-9. EQT Table Example

If T is specified for a device, a value for T must be entered in the appropriate (T=) blank. The value must be a positive decimal number (representing tens of milliseconds) within the range of 1 through 32767. The value entered denotes the maximum amount of time that will elapse before a time-out will be issued for that device. If a device has not interrupted the system within the amount of time specified, it is considered to have timed out and may be set down. Note that time-outs can occur for the system console but it will not be set down. Devices that are controlled by drivers that handle their own time-outs may or may not be set down. For interactive devices, (e.g., terminals) T should not be less than 500.

If X is specified, a positive decimal value (maximum of three digits) for X must be entered in the appropriate (X=) blank. This value is the number of words that are declared for buffer space (temporary storage) and consequently are allocated to the EQT entry (EQT extension) for the driver's use.

STEP 20 -- DEVICE REFERENCE TABLE

This message is issued prior to requests for logical unit assignments. The Device Reference Table, which specifies the logical unit (LU) numbers, is cross-referenced to the EQT entry numbers. The logical unit request than follows:

1 = EQT #?

Enter the Equipment Table entry number and the subchannel number (if appropriate) associated with Logical Unit number 1.

Following this entry, the logical unit number is incremented by one, and the prompt is redisplayed:

2 = EQT #? This sequence is repeated up to lu 254.

Entries to the Device Reference Table are in the form:

eqt entry, subchannel

where:

eqt entry	is the EQT entry number to be associated with the displayed logical unit number.
subchannel	is the subchannel number (< or equal to 31) of the device referenced by this entry (if not included, defaults to 0).

The first six logical unit numbers are reserved for system devices, as follows:

LU1 -- system console
LU2 -- system disc subchannel
LU3 -- auxiliary disc subchannel (optional)
LU4 -- standard output unit
LU5 -- standard input unit
LU6 -- standard list unit.

Note that LU8 is recommended for magnetic tape.

Any LU assigned to EQT entry number zero, indicates the bit bucket. This is a system mechanism that allows immediate I/O completion; i.e., the data buffer is immediately read from or written to a nonexistent device.

Extra logical unit numbers can be assigned EQT entry number zero during generation. These assignments may then be changed on-line, as desired, to reference other EQT entry numbers.

Terminate the Device Reference Table entries using the input data terminator, /E.

STEP 21 -- INTERRUPT TABLE

Following display of this message you enter (in ascending order) interrupt data that link octal select codes to EQT entry numbers or the names of programs that are to be scheduled upon interrupt. Each select code, in ascending order, is referenced back to its EQT entry number in the Equipment Table.

The Interrupt Table (INT) entries have the following form:

select code,option,destination

where:

select code,EQT,n	relates select code to EQT entry number n.
select code,PRG,pppp	causes program pppp to be scheduled upon interrupt.
select code,ENT,entry	causes control (upon interrupt) to transfer to the specified entry point of a Type 0 system program. If the entry refers to a driver entry point, the driver to be entered must reside in the System Driver Area (SDA).
select code,ABS,xxxxxx	places the absolute octal value xxxxxx (instruction code) in the interrupt location. (Do not place anything other than a JMP or JSB or a macro to a microcoded subroutine in this trap cell because an interrupt does not preserve the current status of the memory protect system or the status of the Dynamic Mapping System.)

Terminate the Interrupt Table entries using the input data terminator, /E.

For example, assume that EQT entry number 1 (the first EQT entry) for a 7905/7906/7920/7925 disc was assigned select code 11,DVR32,D. Then, in the Interrupt Table, select code 11 must be referenced to EQT entry number 1, which contains the relocated address of DVR32. DVR32 then will be entered upon interrupt. The format for this Interrupt Table entry is shown in Figure

2-10.

For devices or subsystems that have more than one I/O card, refer to the I/O card or subsystem documentation covering that device or driver for more information regarding Interrupt Table entries. In any case, each I/O card must have an Interrupt Table entry. Note that interrupt location 4 (power fail) may be changed from a HALT 4 (102004) to an ENT entry if a power fail routine is included in your system. For example:

```
4,ENT,$POWR
```

($POWR is the entry point in the power fail routine.)

The last part of the Table Generation Phase requires no operator input. At this point in the generation, Table Area I modules are relocated and mapped according to the options that were specified during the Program Input Phase.

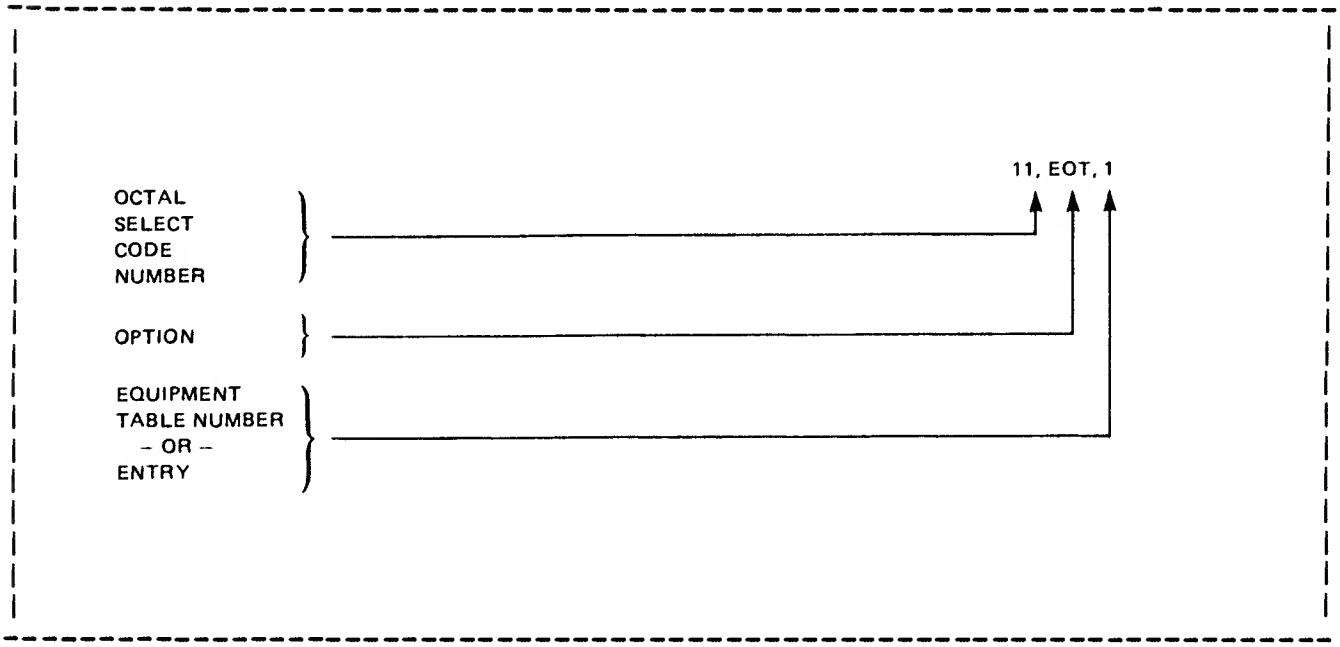


Figure 2-10. Interrupt Table Example

System Boundaries Phase

The planning of generation responses may be difficult beyond this point because some of the responses are based on generation-specific information not yet known to the user. Refer to the System Manager's Manual for more information concerning this phase of system generation. (Refer to the example given in Figure 2-11 as you follow the steps in this phase.)

After Table Area I modules are relocated, the generator prints:

```
STEP 22 -- DRIVR PART 00002
           CHANGE DRIVR PART?
```

The generator reports the two-page default size of the driver partitions and asks for any change.

To change the size of the driver partitions, enter a decimal number of pages greater than the reported value and less than 17. The number entered here will be the total number of logical pages to be allocated to the driver partition (e.g., if a 5 is entered, the driver partition will be five logical pages long). Otherwise, enter a 0. The driver partition size should be increased if user-written drivers are larger than the driver partition default size; otherwise the generator will be aborted when an attempt is made to relocate such a driver.

At this point, driver partition #1 is relocated and the generator prints the driver partition number along with its starting physical page number:

```
     DP  01  <<PAGE XXXXX>>:
        DVy3n map here
```

The system disc driver will be relocated first into driver partition #1. If space remains between the end of the disc driver and the end of the driver partition, the generator will relocate any other drivers that will fit into the partition. The remaining drivers will be relocated into the System Driver Area (if so specified) or into additional driver partitions.

Once driver partition #1 has been relocated, the generator prints:

```
    SUBSYSTEM GLOBAL AREA <<PAGE XXXXX>>:
```

and the SSGA modules (type 30) are relocated.

(22)	DRIVR PART 00002	(dec. # of pages)
	CHANGE DRIVR PART?	(increase driver partition size?)
	0	(enter dec. # of pages > reported value and < 17, otherwise 0)
	DP 01 ≪PAGE XXXXX≫ :	
	DVY3 x map here	(load map for system disc driver plus any other drivers that will fit in this driver partition)
(23)	RT COMMON xxxxx	(dec. # of words)
	CHANGE RT COMMON?	(change real-time COMMON?)
	100	(enter dec. # of WORDS > reported value, otherwise 0)
	RT COMMON ADD xxxxx	(octal address)
(24)	BG COMMON xxxxx	(reported in dec. words)
	CHANGE BG COMMON?	(change background COMMON?)
	1	(enter dec. # of PAGE increments - 1024 words each, otherwise 0)
	BG COMMON ADD xxxxx	(octal address)
	BG COMMON xxxxx	

Figure 2-11. Sample Boundaries Phase Worksheet

STEP 23 -- RT COMMON xxxxx
CHANGE RT COMMON?

The generator reports the default size of Real-Time COMMON in decimal number of words and asks for any change. The default size will reflect the largest amount of blank Real-Time common declared by any programs specified during the program input phase. Real-Time COMMON should be increased if any programs to be loaded on-line will declare more Real-Time common than the default size reported by the generator.

To change the size of Real-Time COMMON, enter a decimal number of WORDS greater than the reported value. Otherwise, enter a 0.

Then, the generator reports the first word address of the Real-Time COMMON area:

RT COM ADD xxxxx

STEP 24 -- BG COMMON xxxxx
CHANGE BG COMMON?

After allocating the defaulted size of Background COMMON, the generator automatically aligns the end of this area to the next page boundary, making use of otherwise wasted space (i.e., assigns the space to Background COMMON). See Figure 2-12.

After reporting the resulting size of Background COMMON, the generator asks for any requested change to this size. To change the size of Background COMMON, enter the decimal number of PAGE increments (1024 words each). Otherwise, enter a 0. Background COMMON should be increased if any programs to be loaded on-line will require more background common than the default size reported by the generator.

At this point, the generator reports the first word address of the Background COMMON area:

BG COMMON ADD xxxxx

Then the generator reports the total Background COMMON size (in decimal words):

BG COMMON xxxxx

System and Program Loading Phase

Following the BG COMMON xxxxx report, the generator relocates the System Driver Area and prints SYSTEM DRIVER AREA <<PAGE XXXXX>>:, followed by the appropriate mapping of the these drivers. The mapping options specify the reporting of names, entry points, and link address of a relocated program. (Refer to the example given in Figure 2-13 as you follow the steps in this phase.) The heading TABLE AREA II <<PAGE XXXXX>>: is printed where XXXXX is the starting physical page.

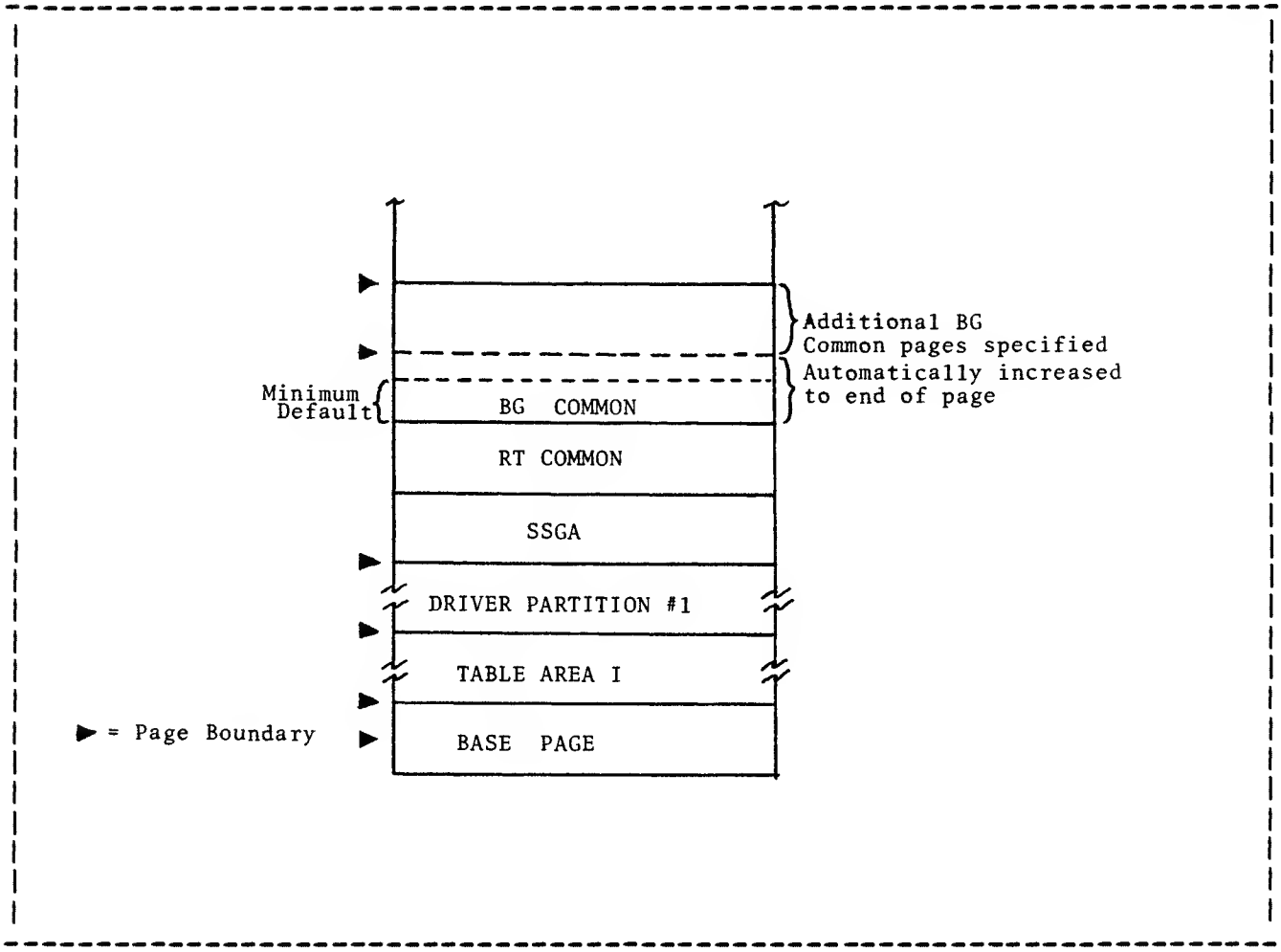


Figure 2-12. BG Common Configuration

TABLE AREA II ≪PAGE XXXXX≫ :

(25) # OF I/O CLASSES?
64 (dec. # from 1 to 255; typical entry would be 10)

(26) # OF LU MAPPINGS?
10 (dec. # from 1 to 255; typical entry would be 10)

(27) # OF RESOURCE NUMBERS?
32 (dec. # from 1 to 255)

(28) BUFFER LIMITS (LOW, HIGH)?
100 , 400 (in words, suggested entry would be 100, 400)

(29) XXXX LONG ID SEGMENTS USED (# USED)
OF BLANK LONG ID SEGMENTS? ("long" ID segments)
32 (total # should be from 1 to 254)

(30) XXXX SHORT ID SEGMENTS USED (# USED)
OF BLANK SHORT ID SEGMENTS?
50 (total # should be from 1 to 256)

(31) XXXX ID EXTENSIONS USED (#USED)
OF BLANK ID EXTENSIONS?
4 (total # should be from 1 to 254)

(32) MAXIMUM # OF PARTITIONS?
32 (dec. # ≤ 64)

Figure 2-13. Sample Sys and Prgm Loading Phase Worksheet

STEP 25 -- # OF I/O CLASSES?

Enter the number of classes required for Class I/O. Enter a number in the range of 0 through 255 (note that a "0" is changed to a "1").

Class numbers are used in the following operations:

- I/O operations without wait. Programs using class I/O can proceed with execution even though their I/O requests have not completed.

- Program to program communication. Class I/O requests can be used to transmit data and synchronize communication between programs.

The number of class numbers allocated in your system will depend on user application program requirements and the HP supported subsystems used. There must be one class number allocated for each class get call simultaneously outstanding. For the class I/O requirements of HP supported software, refer to the RTE-IVB System Managers Reference Manual, and appropriate subsystem manuals and configuration guides. A minimum entry of 10 is suggested.

The allocated number of classes will determine the size of the system class table, $CLAS, located in Table Area II. There is one table word allocated per class number.

STEP 26 -- # OF LU MAPPINGS?

This entry specifies the size of the Batch Switch Table that cross-references real or spool logical unit numbers to user-specified logical unit numbers within batch jobs. Enter a number in the range of 0 through 255 (note that a "0" is changed to a "1").

The number entered here determines the maximum number of SL commands allowed in a batch job initiated outside the session monitor environment. The Batch Switch Table, $LUSW, located in Table Area II, contains one word per LU switch entry. Refer to the RTE-IVB System Manager's Manual (Spool System Generation Chapter) for specific LU mapping requirements. A typical entry here would be 10. IF batch jobs will not be initiated outside the session environment (i.e., from the system console) enter 0.

STEP 27 -- # OF RESOURCE NUMBERS?

Enter the required amount of Resource Numbers (RN's). There must be one RN for each resource to be controlled simultaneously by cooperating programs. Enter a number in the range of 1 through 255 (a 0 is changed to a 1).

Resource numbers provide the capability of synchronizing programs that access the same resource. The resource might be a device, a table in memory, a file, another program, or subroutine. The number of RNs allocated in the system should reflect:

- User application program RN usage. Enough RNs should be allocated to accomodate the maximum number of application programs using RNs or LU locks at one time.

- Subsystem RN usage. Many HP supported programs make use of RNs (e.g., LOADR, FMGR, FTN4, ASMB, XREF, RT4GN, etc.) Most of these programs deallocate resource numbers when finished. There should be one resource number allocated for each program (or copy of the program) running concurrently. For specific utility and subsystem RN requirements, refer to the RTE-IVB System Manager's Manual and appropriate subsystem and configuration manuals.

A minimum entry of 10 is suggested. The allocated number of resource numbers will determine the size of the system resource number table, $RNTB, located in Table Area II. There is one table word allocated per RN.

STEP 28 -- BUFFER LIMITS (LOW,HIGH)?

Enter the lower and upper buffer limits (decimal words) for your system.

Setting these limits here can prevent an inoperative or slow I/O device from monopolizing System Available Memory. Each time a buffered I/O request is made (Class I/O requests are buffered), the system totals the lengths of all buffers for I/O requests queued to that EQT entry and compares the number to the upper limits set here (or by the on-line system command, BL). If the sum is less than the upper limit, the new buffered request is added to the queue. If the sum is larger than the upper limit, the requesting program is suspended in the general wait (Status=3) list.

When a buffered I/O request completes, the system adds up the remaining words in I/O requests queued to that EQT entry and compares the number to the lower limit set here (or by the BL command). When the sum is less than the lower limit, any programs suspended for exceeding the buffer limits on this EQT are rescheduled and may reattempt their request.

A suggested entry of 100 and 400 can be entered and may later be changed on-line with the BL command.

STEP 29 - XXXX LONG ID SEGMENTS USED
OF BLANK LONG ID SEGMENTS

Enter the number of ID segments required in addition to the XXXX long ID segments allocated to programs relocated during generation. Note that a 0 is automatically changed to a 1 to allow on-line loading of at least one program. The total number of long program ID segments, including memory resident and disc resident programs, must be equal to or less than 254.

An ID Segment is a table, associated with each program known to the operating system, used to keep track of the program's name, priority, status, and other characteristics. Blank ID Segments are allocated to identify programs added to the system after it is operational. The following considerations should be taken into account when allocating the number of blank ID segments for the system:

- Permanent Program Usage. One blank ID Segment is required for each program that will be permanently added on line by the relocating loader (LOADR). Therefore, enough blank ID segments should be allocated to accommodate all user application programs and HP supported programs to be permanently added to the system online. Once an ID segment is allocated to a permanent program, its space cannot be recovered unless the program is permanently purged with LOADR (PU option).

- Temporary Program Usage. One blank ID segment is required for each program loaded on line as a "temporary" program by LOADR. Programs are loaded as "temporary" during program development, to create FMP type 6 files, or if they are used infrequently. No permanent record is made of them on disc. Temporary programs are removed from the system by the OF,name,8 operator command. This will free the ID segment for future system use.

- Type 6 File Usage. Blank ID segments are required for each program residing on a type 6 file made available for execution by file manager RP and RU commands. These programs are removed from the system by the OF (described above) or RP command. This will free the ID segment for future system use.

- Multi-Terminal Environment. In systems using the Multi-Terminal Monitor (MTM) or Session Monitor (SM) software packages, blank ID segments must be allocated for each MTM or SM terminal on the system. The number of ID segments allocated per terminal will depend on the number of blank ID segments you want to allocate for program copies. Normally a blank ID segment must be allocated for each copy of FMGR. At least one additional ID segment should be allocated per terminal for programs restored (RP) or run (RU) by the terminal's copy of FMGR. Note that in SM, blank ID segments occupied by temporary and RP'ed programs at log-off are returned to the system for future use.

In summary, the number of blank ID segments required in your system can be estimated as follows:

(# permanently added prog's.)+(max # of temporary and RP'ed programs in system at one time)+(# terminals * # ID segments required per terminal).

For example, a typical system might require:

(10 permanently added progs)+(10 temporary and RP'ed progs)+(5 terminals* 3 segments per terminal)=35 blank ID segments.

Each blank ID segment requires 34 words in Table Area II (33 word ID plus one keyword).

STEP 30 - XXXX SHORT ID SEGMENTS USED
OF BLANK SHORT ID SEGMENTS?

Enter the number of blank "short" ID segments required in addition to the XXXX short ID segments allocated to programs relocated during generation. These ID segments have ten words (nine-word ID plus one keyword) and are used for real-time and background program segments. One short ID segment is required for each program segment. If a segmented program on-line load is performed, and there are no blank short ID segments available, 34-word long ID segments will be used (if they are available) for the segments.

For a "worst case" estimate of your blank short ID segment requirements, determine the total number of segments to be used by user application programs and HP software at any given time. Short ID segments are used by programs added on-line via permanent loads, temporary loads, and RP commands (see step 29). Note that copies of segmented programs share the same short ID segments.

This estimate will allow all segmented programs in the system to be active concurrently. If this is not a requirement, less blank short ID segments can be allocated. For the short ID segment requirements of HP utilities and subsystems, refer to the RTE-IVB System Manager's Manual, the appropriate subsystem manuals, and configuration guides. Short ID segments are located in Table Area II.

STEP 31 - XXXX ID EXTENSIONS USED
OF BLANK ID EXTENSIONS?

Enter the number of blank ID segment extensions required in addition to the XXXX ID extensions allocated to EMA programs relocated during generation. One blank ID extension is required for the on-line load of each EMA program. (Note that a 0 entered here will automatically be changed to a 1.)

An EMA program cannot be loaded on-line if there are no blank ID extensions available. The number allocated should reflect the estimated maximum number of EMA programs to be loaded on-line in the system at any one time. Each ID extension is four words (three words plus one keyword) in length and is located in Table Area II. A suggested entry here is five ID extensions.

STEP 32 - MAXIMUM # OF PARTITIONS?

Enter the maximum number of program partitions to be allowed in the system. Enter a number in the range of 0 through 64.

The actual number of defined partitions is determined in Step 34 when the remainder of physical memory is divided into partitions. It is possible to define (in Step 34) fewer partitions in the system than you specify here (e.g. you could enter a 64 here, but only define five partitions in Step 34). Partitions can be redefined by the reconfigurator at system startup, but the total number of partitions cannot be changed. If you are unsure of your requirements, a guideline for determining the maximum number of partitions is:

(# pages physical memory ever to be included in system)/12

The number entered in this step will determine the number of entries in the partition definition table, $MATA, located in Table Area II. Seven words are allocated per entry.

After the above question is answered, the generator prints the following headings and relocates the corresponding modules. (Note that the Load Maps generated will be dependent on the MAP command in effect during the relocation phase, see Step 16a).

TABLE AREA II MODULES

Table Area II (type 13) modules are relocated after memory area is reserved for the tables described above.

SYSTEM <<PAGE XXXX>>

The RTE operating system modules are relocated. The generator will relocate here all type 0 modules except drivers (since drivers are associated with an EQT entry). After the operating system, the reconfigurator (type 16) module is relocated.

PARTITION DRIVERS

DP 02 <<PAGE XXXXX>>

.

DP 03 <<PAGE XXXXX>>

.

.

.

Partition resident drivers are relocated next. These will be type 0 modules witn an EQT associated with them (without the M or S EQT parameters). As many drivers as will fit are relocated into a driver partition. If the generator discovers a driver that is larger than the specified driver partition size (see Step 23), the generation will be aborted with a GEN ERR 59.

Should an additional driver overflow the logical address space reserved for a driver partition (because of subroutines appended during relocation), RT4GN will issue the message:

DRIVER PARTITION OVERFLOW

Tne relocation of the driver causing the overflow will be ignored, and the driver will be re-relocated into a subsequent driver partition. Note that no operator intervention is required. After the above message is issued and backup is done, the generator scans for other driver(s) that may be relocated into this driver partition.

MEMORY RESIDENT LIBRARY <<PAGE XXXX>>

The memory resident library contains all type 14 force-loaded modules, and all Type 6 modules referenced by Type 14 modules or memory resident (Type 1) programs.

Note that a pseudo-load of all memory resident programs is done at this time in order to send all referenced Type 6 subroutines into the memory resident library. If a relocation error occurs for a memory resident program, it will be duplicated here.

MEMORY RESIDENTS <<PAGE XXXX>>

The generator relocates the memory resident programs.

RT DISC RESIDENTS

Then the generator relocates the real-time disc resident (Type 2) programs.

BG DISC RESIDENTS

Finally, the generator relocates the background disc resident programs. Type 3 background programs are relocated first, followed by Type 4 background programs.

Partition Definition Phase

When relocation is completed, the generator prints a report of program partition requirements for the real-time and background disc resident programs. (Refer to the example given in Figure 2-14 as you follow the steps in this phase.) Type 4 background disc resident programs will have an "*" appended to the display line. Programs declaring EMA will have an "E" appended to the display line. The page requirements displayed for EMA programs include the declared EMA page size, or a 1 for defaulted EMA size (meaning that the program declared EMA, but no size was specified). These reports are in the form:

```
RT PARTITION REQMTS:

    program name xx PAGES
    program name xx PAGES
    .
    .
    program name xx PAGES   E

BG PARTITION REQMTS:

    program name xx PAGES   *
    .
    .
    program name xx PAGES   E
```

The page count reported for each program is the number of pages they occupy in memory (including base page).

Next, the generator reports the largest addressable program size (excluding EMA) for Type 4 BG programs both with and without COMMON, and for RT and Type 3 BG programs having Table Area II in their address space. The size includes one page for base page. This report is in the form:

```
MAXIMUM PROGRAM SIZE:
W/O COM xx PAGES
W/  COM xx PAGES
W/TA2   xx PAGES
```

You can declare partitions larger than the reported number of pages, but the extra pages will be accessible only by EMA programs.

```
STEP 33 - SYS AV MEM: xxxxx WORDS
          ENTER 1ST PARTITION PAGE:  XXXXX(DEFAULT)TO YYYYY:
```

The generator reports the default size (in decimal words) of System Available Memory (from the end of Table Area I and from the overlay of the system reconfiguration program). Refer to Figures B-1 and B-2 in Appendix B to locate these areas.

Partition Definition Phase

RT PARTITION REQMTS: (generator lists page requirements)

.
.
.

BG PARTITION REQMTS:

.
.
.

MAXIMUM PROGRAM SIZE:

W/O COM xx PAGES

W/ COM xx PAGES

W/ TA2 xx PAGES

SYS AV MEM: xxxxx WORDS (reported in decimal words)

(33) ENTER 1ST PART PAGE: XXXXX (DEFAULT) TO YYYYY:

_____ (enter dec. pages # value between XXXXX and YYYYY, otherwise 0 - for default value XXXXX)

SYS AV MEM: xxxxx WORDS (new size of SAM reported, decimal words)

PAGES REMAINING: xxxxx (pages remaining for partitioning)

(34) DEFINE PARTITIONS: (see manual about subpartitions)

PART 01, XXXX PAGES? (prompts to maximum of 64, displaying # pages remaining, may ask for SUBPARTITIONS)

3 , RT , _____ (decimal page size, type ,[R])

PART 02, XXXX PAGES?

5 , BG , _____

PART 03, XXXX PAGES?

6 , BG , _____

PART 04, XXXX PAGES?

9 , BG , _____

PART 05, XXXX PAGES?

11 , BG , _____

PART 06, XXXX PAGES?

15 , BG , _____

PART 07, XXXX PAGES?

19 , BG , _____ (terminate your final entry with a /E)

Figure 2-14. Sample Partition Definition Phase Worksheet

PART 08, XXXX PAGES?
100 , BG ,
SUBPARTITIONS ?
YES , ,
PART 09, XXXX (YYYY) PAGES?
15 , S ,
PART 10, XXXX (YYYY) PAGES?
15 , S ,
15 , S ,
27 , S ,
28 , S ,
200 , BG ,
YES , ,
15 , S ,
15 , S ,
15 , S ,
15 , S ,
15 , S ,
15. , S ,
15 , S ,
15 , S ,
20 , S ,
20 , S ,

(subpartition mode - the number in parenthesis indicates the number of pages remaining in the mother partition)

Figure 2-14. Sample Part. Def. Phase Worksheet (Cont.)

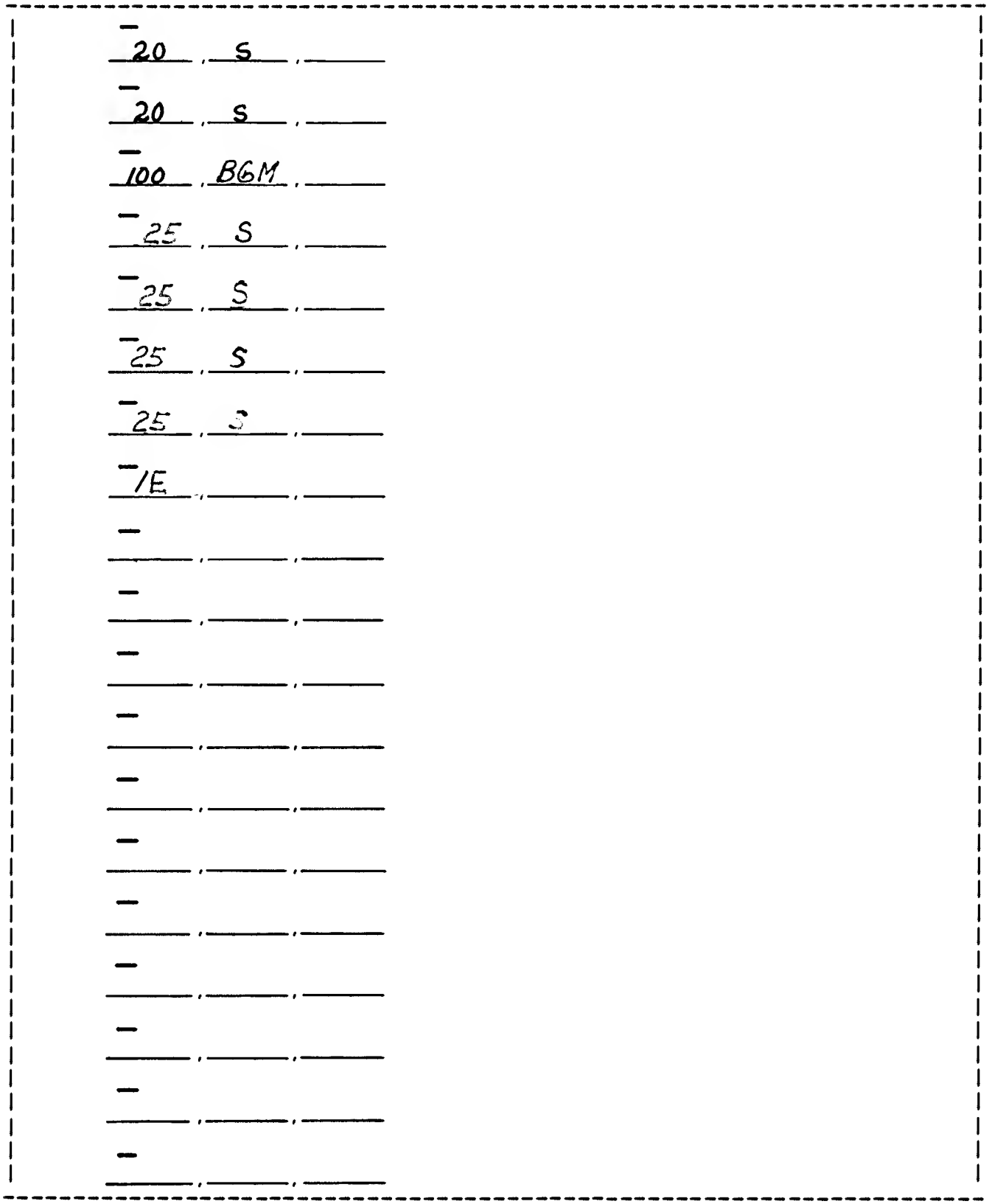


Figure 2-14. Sample Part. Def. Phase Worksheet (Cont.)

(35) MODIFY PROGRAM PAGE REQUIREMENTS?

—	(generator prompt)
EMGR , 15	(program name, decimal # of pages)
—	
LOADR , 15	(terminate your final entry with a /E)
—	
EDITR , 11	
—	
/E ,	
—	
,	
—	
,	
—	
,	
—	
,	

(36) ASSIGN PROGRAM PARTITIONS?

—	(generator prompt)
/E ,	(program name, partition #)
—	
,	(terminate your final entry with a /E)
—	
,	
—	
,	

SYSTEM STORED IN FILE
SYS SIZE: ttt TRKS, sss SECS (XX SECTORS/TRACK)
= XXXXXX BLOCKS (128 WORDS/BLOCK)

RT4GN FINISHED

xxxx ERRORS

Figure 2-14. Sample Part. Def. Phase Worksheet (Cont.)

The generator reports the page number of the first physical memory page available for user partitions as XXXXX and allows you to increment this if you wish.

To change the first page available for partitions, enter a decimal page number value (between XXXXX and YYYYY inclusive), specifying the starting page for partitioning. Otherwise, enter a 0 and the default value XXXXX will be assumed.

Any pages of memory skipped over are allocated to SAM (1024 decimal words per page).

The new size of SAM (in decimal words) is reported:

```
SYS AV MEM:xxxxx WORDS
```

Next, the decimal number of pages of physical memory remaining for partitioning is reported:

```
PAGES REMAINING:xxxxx
```

The user may or may not wish to allocate additional space for SAM, depending on the use and type of system being generated. The size of SAM should be determined by site-specific needs; however, the user should bear in mind that System Available Memory will be used for the following items:

- Buffered Output. SAM will be used as an output buffer area for buffered devices, that is, devices that have automatic output buffering enabled (i.e., B option set in their EQT entry). The System Manager should generate enough system available memory in the system for each buffered device. On output operations the system will use SAM as a temporary buffer area before outputting information to the device. The maximum amount of SAM used for each device will be specified by the high buffer limit (generator Step 28). To compute your worst case SAM buffer usage, multiply the number of buffered devices in your system by the high buffer limit. This amount of SAM may or may not be required depending on the degree of I/O activity in your system.

  A more realistic estimate of SAM requirements can be obtained by the formula: B*(A/B)*L.

  where:

  B is the number of buffered devices in your system.

  A is the estimated maximum number of buffered devices being output at any one time.

L is the amount of buffer storage used per device. If the rate of program output is significantly faster than the device can accept (as is normally the case), L will be the system high buffer limit.

For example, if a system has 10 buffered terminals, 5 of which will be output to any one time, and a high buffer limit of 400, the amount of additional SAM required for buffering is 10*(5/10)*400=2K words.

- Class I/O. All Class I/O read, write, and control requests are buffered in SAM. User application programs may use class I/O for device I/O (i.e., I/O without wait) or interprogram communication (i.e. "mailbox" I/O). The amount of SAM used for this purpose will depend on the number and length of class buffers residing in SAM at any one time. A class buffer will reside in SAM from the time it is sent to SAM with a class I/O call until it is returned with a Class GET call. Specifically, you may want to determine:

  * What mix of user application programs using Class I/O will be active simultaneously

  * What size class buffers will be used in these programs

  * How many class buffers will be outstanding at any one time

  Note that each class buffer in SAM requires space for an 8 word header in addition to the buffer specified in the EXEC call.

- Scheduling String Passage. When programs are scheduled via the File Manager RUN or operating system RUN or ON commands, the entire Command String is stored in SAM so that it may be retrieved later by the scheduled program. Once retrieved, the space is freed for other uses. Buffers may also be passed to scheduled programs in the schedule EXEC calls.

  The amount of SAM required for each string buffer is usually not large (10-40 words). Furthermore, for programs that retrieve their scheduling string (most HP utilities), the buffer will be in SAM for only short periods.

- Reentrant I/O and reentrant subroutine processing. When I/O is performed from a temporary data block (TDB) inside a reentrant subroutine, the TDB is moved into SAM. This allows the calling program to be swappable. Most HP subsystems (e.g. FMGR, EDITR) use this technique when performing I/O to the terminal. In addition, programs using the FORTRAN formatter use reentrant I/O. A guideline for estimating your SAM requirements in this regards is:

  (Number of terminals in system) * (Buffer Length).

Normally, the buffer length is approximately 45 words. For example, if program development will be done on ten terminals concurrently, 10X45=450 additional words of SAM should be allocated for reentrant I/O.

Besides reentrant I/O, reentrant subroutines are used when subroutines are shared by more than one program. These subroutines will be located in either the Memory Resident library or SSGA. Reentrant subroutines used in this manner require SAM for their reentrant tables and temporary data blocks. The amount of SAM used by a reentrant subroutine is dependent on the number of programs calling the subroutine at any one time. If you will be generating reentrant subroutines in your system, you may wish to allocate additional SAM for reentrant processing. A rough guess/estimate, of your SAM requirements can be obtained by: N*(average TDB size). Where N is the estimated number of programs using reentrant subroutines.

- HP Subsystem Usage. In addition to using SAM in the ways described above, several HP subsystems (e.g. Session Monitor, DS/1000) allocate blocks of SAM directly from the operating system. These blocks are allocated at subsystem initialization and are used for table storage, pointers, etc. Refer to the RTE System Manager's Manual, appropriate subsystem manuals, and configuration guides for subsystem SAM requirements.

The above guidelines are designed to give you a rough estimate of your SAM requirements. If more SAM is required at any one point than you have generated into your system, you will cause those programs requesting SAM to go into memory suspend (state 4), thus degrading system performance. If this occurs frequently, it is suggested that additional SAM be allocated to the system by running the RTE reconfigurator program at system startup. Refer to the RTE-IVB System Manager's Manual for details.

STEP 34 - DEFINE PARTITIONS:

The number of remaining memory pages reported in Step 33 must now be divided into real-time and/or background partitions.

Following the printing of this heading, the generator prompts you for the definition of your first partition, along with the number of remaining pages.

```
PART  01,  XXXX PAGES?
```

Enter the partition definitions in the following form:

```
size,type[,R]
```

where:

size	is the partition size in number of pages (decimal). A partition must include enough pages for the program, plus one page for the program's base page.
type	is RT for a real-time partition, RTM for a real time mother partition, BG for a background partition, BGM for a background mother partition, and S for a subpartition
R	is the "reserve" flag. If specified, the partition may be used only by programs specifically assigned to it (see Step 36).

Following each entry (including subpartition definitions), the partition number is incremented by one, and the prompt is redisplayed:

```
PART 02,  XXXX PAGES?
```

Terminate the partition definition list using a /E.

If you define a BG or RT partition to be larger than the maximum program size declared in Step 32 (i.e., W/O COM XX PAGES), the generator will prompt:

```
SUBPARTITIONS?
```

If you respond with a NO to the subpartition query, the generator will define a regular partition of the requested size and type. In this case it is the user's responsibility to manage the additional memory beyond the 32K words of logical memory. This may require the user to lock himself into memory to avoid the loss of data integrity during a program swap.

If you respond YES to the subpartition query, or have specifically requested a mother partition by specifying BGM or RTM, the generator will define a mother partition of the requested size and enter subpartition mode. It will now expect you to divide the mother partition into subpartitions (S type). Note that the sum of the subpartition sizes cannot exceed that of their mother partition. A subpartition will be the same type (i.e. RT or BG) as its mother partition. The generator will exit subpartition mode when you define the next RT or BG partition. The following is displayed when in the subpartition mode:

```
PART  YY, XXXX, (ZZZZ) PAGES?
```

The number in parenthesis indicates the number of pages remaining in the mother partition.

The sum of all regular or mother partition sizes (i.e. all partitions defined with either RT or BG) must equal the number of pages allocated for partitioning reported in Step 33 (i.e. PAGES REMAINING XXXXX).

It may not be possible to completely plan partition sizes until the program requirements and the number of remaining pages are actually reported by the generator.

A program cannot be dispatched for execution unless a partition of sufficient size is defined and available (not reserved for the exclusive use of other programs).

The user must determine the mix of real-time and background partitions of appropriate sizes subject to available main memory and the need of their particular applications. The purpose of having two classes of partitions is to prevent competition for main memory between background programs (typically involved in program development and other non-time critical applications) and real-time programs. Note that the class of a partition does not imply any special capability.

In some situations, placing all partitions in a single class may be best. This allows free competition for main memory between all disc programs, subject to program priority and size requirements.

Undesired competition for partitions can be prevented by assigning programs to specific partitions. This could, for example, keep a very small program out of a large partition. Assignments can cross class boundaries; e.g., a real-time program can be assigned to run in a background partition, but such a program would still have all the attributes of a Real-Time program.

Subpartitions provide optimized use of memory, since non-EMA programs can execute in the subpartitions while programs that use EMA are not running (or are suspended) in the mother partition. If a program with EMA should request use of the mother partition while non-EMA programs are executing in the subpartitions, more swapping time (to swap out the programs in the subpartitions) is obviously required, so the user must decide which alternative is best for his program applications. If the BGM & RTM commands are used to break up large partitions into subpartitions, it should be noted that a background or real-time program will not execute in the mother partition unless it is assigned to it.

STEP 35 - MODIFY PROGRAM PAGE REQUIREMENTS?

At this point you can modify disc resident program page requirements. The default size of each program is reported at the beginning of the Partition Definition Phase.

The page requirements of EMA programs cannot be overridden. The size override must not exceed the maximum program address space listed for that type of program. Enter each disc resident program override using the following form:

```
program name,pages
```

where:

program name	is the name of the program requiring a size override.
pages	is the decimal number of pages required to run this program (include one page for the base page).

Terminate the page requirements list using a /E.

Some programs require additional space to dynamically construct buffer areas or symbol tables. Standard RTE programs needing this space are discussed in the RTE-IVB System Manager's Manual. During generation the user must modify the page requirements of these programs before they can be used. Size requirements for non-EMA user supplied programs may also be overridden if necessary. Note that all compilers, generators, loaders and cross reference (XREF) programs will use as much memory as they are assigned. It is possible to temporarily modify page requirements after generation by using the "SZ" command. Refer to the RTE-IVB Programmer's Reference Manual for more information regarding this command.

Note that overriding a program's page requirements will increase the minimum partition size required to execute the program. The system may actually execute the program in a partition larger than this minimum. To the program, however, the "apparent" size of the partition (determined from the System Communication Area during execution) is still the minimum.

The page requirements of a program using EMA cannot be overridden during generation. This may be done only by LOADR during an on-line load.

An example of entering the program size override follows:

RT4GN,24	The On-Line Generator is assigned 24 pages and will not run in a partition smaller than that size (but can run in a larger partition).

STEP 36 - ASSIGN PROGRAM PARTITIONS?

The last step in the generation procedure is that of assigning programs to run in a specific partition. Enter only those programs you wish to assign to a partition, using the following form:

program name,partition #

where:

program name	is the name of the program to be assigned to a partition.
partition #	is a number between one and the maximum number of partitions defined in your system (declared in Step 31). A GEN ERR 49 will occur if a program is assigned to a partition that was not defined.

Terminate the program assignment list using a /E.

An example of program assignment to a partition follows:

WHZAT,1	Program WHZAT will execute only in partition #1. Note that other programs can also use this partition unless it was specifically reserved (in Step 35) for WHZAT and assigned only to WHZAT.

Note that the system AS command allows the changing of program assignment after generation.

Mother partitions are used only for those programs using EMA (Extended Memory Area) or for those programs specifically assigned to them. When an EMA program is not assigned to a specific partition it will (by default) execute in a mother partition. Regular partitions will not be used by EMA programs unless specifically assigned to them. (This is true even if the partition is greater than the maximum logical address space.)

When the generation is completed, the generator reports that the system is stored in a file, followed by a report of the system size in decimal number of tracks and sectors (128 word sectors) and the equivalent total in blocks. The number of errors (FMP and GEN ERR's, excluding UNDEFS) encountered during generation are also reported.

```
SYSTEM STORED IN FILE
SYS SIZE:ttt TRKS, sss SECS    (XX SECTORS/TRACK)
       =   XXXXX BLOCKS        (XXX WORDS/BLOCK)

RT4GN FINISHED

xxx ERRORS
```

Chapter 3
System Generation

Introduction

The On-Line Generator executes in the minimum software environment that was defined in Chapter 1.

This chapter provides directions for running the RTE-IVB On-Line Generator program (RT4GN) to configure your RTE-IVB system.

It is assumed at this point that you have already planned (with the aid of the instructions and worksheets included in the appropriate documentation) your configuration and actual responses to the generator's queries. Most of the responses required during generation will be taken directly from the worksheets.

Executing the On-Line Generator

The On-Line Generator program (RT4GN) is executed using either the system or FMGR command, RU. You can either create an answer file (disc transfer file or logical unit) that contains the information required by the generator or you can provide this information interactively, via the user console.

The syntax of the RU command used to execute the On-Line Generator is:

```
RU,RT4GN          ,filenm[:sc[:cr]]
                  ,lu
```

where:

filenm	is the name of a file that contains a generation answer file
sc	is the security code of the file
cr	is the cartridge reference number for the file
lu	is the logical unit number of the input device (e.g., a mini-cartridge) from which an answer file will be retrieved.

If no input parameters are specified, the generator assumes the interactive mode and displays prompt messages on your console. You respond to these messages by entering information to direct the generator. (Note that in the following examples, the colon characters represent FMGR prompts.)

Example:

```
:RU,RT4GN
```

When you enter the RU command in this form, the RTE On-Line Generator program is scheduled for execution in the interactive mode at the user's terminal.

Example:

```
:RU,RT4GN,ANSFIL:KH
```

When you enter the RU command in this form, the RTE On-Line Generator program is scheduled, and generator responses are supplied to RT4GN from a disc answer file named ANSFIL. A security code of "KH" is also specified.

Example:

```
:RU,RT4GN,5
```

When you enter this form of the RU command, the RTE On-Line Generator program is scheduled, and generator responses are supplied from Logical Unit 5.

If the parameter specified in the RUN command is an interactive device (e.g., a terminal), the ECHO option will cause commands and responses to be echoed to that device. (Note that echo is suppressed when the current device is the same as the default device.) Similarly, error messages will be sent, and control may be transferred, to this device.

If the parameter specifies a non-interactive input (e.g., file manager file), the ECHO option will cause messages and errors to be routed to LU 1.

If you wish to generate from an answer file but want the generator's echo and/or error messages to be sent to your terminal, use the terminal as the default input device and then transfer to the answer file.

Example:

```
RU,RT4GN
```

Then the generator will request (at your console):

```
LIST FILE NAME?
```

You can respond with the following:

```
TR,ANSFIL::2
```

RT4GN will then proceed under the direction of your answer file, ANSFIL.

Response and Comments

Standard user responses are entered as a line, followed by a carriage return. Whenever a response is expected, one or more comments may also be entered. A comment begins with an asterisk (*) and terminates with a carriage return. When the generator encounters an asterisk in a line, it considers the remainder of that line to be a non-executable statement. A comment may either be entered on the same line as a response or as a separate line. If the comment is entered as a separate line (or lines), a response line is entered on the following line. Restrictions on the use of comments are given in Chapter 2. Comments are useful when transferring response input from the console to an answer file and also for documentation purposes.

Error Handling

If an error has been made that will not be detected by the on-line generator, such as specifying the wrong EQT number for a certain LU in the Device Reference Table portion of the Table Generation Phase, the error can be corrected by restarting the on-line generator program and specifying the corrected responses interactively or in a corrected answer file.

Error conditions detected by the on-line system generation result in the following two types of numbered error messages:

1. File reference errors that result in an FMP error code, in the form:

   FMP ERR-nn filenm

   where:

   nn — is a decimal number equivalent to the FMP error codes that are defined in the Batch-Spool Monitor Reference Manual

   filenm — is the file name or LU on which the error occurred.

   An FMP error may result from incorrect references to the list file, absolute output file, answer file, bootstrap file, scratch file, or a file specified in a RELOCATE command.

2. An error condition encountered by the On-Line Generator that results in a generator error code, in the form:

   GEN ERR nn

   (name)

   where:

   nn — is a positive decimal number

   (name) — specifies, in some error messages, the program or entry point name further identifying the cause of the error.

All of the numbered error messages are summarized in Appendix G.

Note that after certain errors, control is transferred to the appropriate console for user action (refer to the EXECUTING THE ON-LINE GENERATOR section for details).

On abortive errors ("irrecoverable"; e.g., 00, 17, etc.), RT4GN will purge the absolute output file, scratch file, and boot file (if any) before terminating. The list file and answer file will remain.

When an error occurs on the list file during generation (e.g., the inability to create an extent due to lack of FMGR disc space), the appropriate FMP ERR is reported, in addition to a GEN ERR 22. In such cases, the generator prompts the operator with:

OK TO CONTINUE?

A YES response causes the generation to proceed with the listed output being sent to the user console only. The listed output will go to the console even if a NO was entered in response to the ECHO? query. Note that a TR command does not need to be entered even if command input was being received from an answer file or LU. An FMP -005 error may result on the last record if you attempt to list the file via the File Manager.

A NO response aborts the generation.

The following message is printed by the generator to inform you that a driver partition overflow has occurred on the most recently relocated driver:

DRIVER PARTITION OVERFLOW

This message is for documentation purposes only and tells you to ignore the load map printed (if any) for the last driver relocated. RT4GN will re-relocate this driver into a subsequent driver partition. No operator intervention is required for recovery and no transfer is made to the user console.

Certain error conditions encountered during generation cause one of several unnumbered error messages to be output by the generator. At this point, the generator is suspended until the problem is resolved. The unnumbered error messages that can occur are the following:

GENERATOR WAITING FOR TRACKS

This message is displayed when the generator cannot obtain the necessary scratch tracks. Operation continues when tracks become available (e.g., when another program terminates, releasing tracks).

GENERATOR WAITING ON LIST LU LOCK

This message is displayed when the generator attempts a logical unit lock of the list LU (only if the list device is non-interactive). Operation continues when the logical unit lock can be accomplished (e.g., when another program terminates, releasing the LU lock).

Number Systems

The On-Line Generator uses octal numbers when listing word addresses (including interrupt trap cell locations and device select codes). Your responses that specify word addresses must be entered in octal notation. All other quantities, including page references and reports of number of words, are expressed in decimal notation.

Generator Scratch File

The generator creates a temporary scratch file named @@NM@A that it uses for storing the modified NAM records of either compiled programs or those programs that have their priority/execution interval changed during the Parameter Input Phase. If a file named @@NM@A already exists, the generator increments the last character of the file name (e.g., @@NM@A is incremented to @@NM@B) and tries to create a file with the new name. This process continues (maximum of 26 times) until the generator can create a new file. Before termination, the generator automatically purges (during its clean-up operations) the file that it created. However, the generator does not purge any other file(s) that may exist from other generations.

Sample Generation

The following pages discuss an actual RTE-IVB system generation in a step-by-step procedure. Sample worksheets prepared for this RTE system generation are included in Chapter 2. A sample answer file format for the generation is given in Appendix E, and the listed output (or printout) produced during the generation process is included in Appendix F.

RTE-IVB System Generation Example

RT4GN execution begins following entry of the RU command. Assume the interactive mode in the following example. The generator's queries are shown, followed by the user's responses.

Initialization Phase

When execution begins, the generator requests the namr of the list file or the logical unit number of the device that will receive the listed output from the generator. In this case, a file named LIST4 (cartridge label 1904) is specified:

```
LIST FILE NAMR?
SYSLI:DB:QQ::450
```

The generator asks if the listed output is to be echoed to the user console:

```
RTE-IV GENERATOR MODEL 92068A   5:41 PM TUE.,  1 MAY., 1979
ECHO?
YES
```

Next, the generator requests a namr (filesize parameter must be specified) for the output file:

```
OUTPUT FILE NAMR?
SESSY:DB:QQ::4000     * OUTPUT FILE
```

The generator requests the type of disc on the system for which this generation is produced (destination system):

```
SYSTEM DISC MODEL?
7925                  * 7925 SYSTEM DISC
```

The generator requests the octal select code of the system disc controller:

```
CONTROLLER SELECT CODE?
11                    * CONTROLLER SELECT CODE
```

The generator requests the number of tracks, starting cylinder number, starting head number, number of surfaces, unit number, and number of spare tracks (all decimal) for subchannel 0. Enter these decimal values separated by commas. (Blanks may be freely used to make user responses more readable.)

The generator will continue to display a subchannel number following each entry up to subchannel 31, or until terminated by the entry of the input data terminator, /E. For this example:

```
   MODEL, # TRKS,FIRST CYL #,HEAD,# SURFACES,UNIT,# SPARES FOR SUBCHNL:

* DISC  #TRKS  1ST-CYL  HEAD  #SURFACES UNIT  #SPARES
  7925,  256,     0,     0,       9,      0,      5   *SUBCHANNEL 0
  7925, 1500,    29,     0,       9,      0,     66   *SUBCHANNEL 1
  7925,  193,   203,     0,       9,      0,      5   *SUBCHANNEL 2
  7925,  193,   225,     0,       9,      0,      5   *SUBCHANNEL 3
  7925,  193,   247,     0,       9,      0,      5   *SUBCHANNEL 4
  7925,  193,   269,     0,       9,      0,      5   *SUBCHANNEL 5
  7925,  193,   291,     0,       9,      0,      5   *SUBCHANNEL 6
  7925,  193,   313,     0,       9,      0,      5   *SUBCHANNEL 7
  7925,  193,   335,     0,       9,      0,      5   *SUBCHANNEL 8
  7925,  193,   357,     0,       9,      0,      5   *SUBCHANNEL 9
  7925,  193,   379,     0,       9,      0,      5   *SUBCHANNEL 10
  7925,  193,   401,     0,       9,      0,      5   *SUBCHANNEL 11
  7925,  256,   423,     0,       9,      0,      5   *SUBCHANNEL 12
  7925,  193,   452,     0,       9,      0,      5   *SUBCHANNEL 13
  7925,  193,   474,     0,       9,      0,      5   *SUBCHANNEL 14
  7925,  193,   496,     0,       9,      0,      5   *SUBCHANNEL 15
  7925,  193,   518,     0,       9,      0,      5   *SUBCHANNEL 16
  7925,  193,   540,     0,       9,      0,      5   *SUBCHANNEL 17
  7925,  193,   562,     0,       9,      0,      5   *SUBCHANNEL 18
  7925,  193,   584,     0,       9,      0,      5   *SUBCHANNEL 19
  7925,  193,   606,     0,       9,      0,      5   *SUBCHANNEL 20
  7925,  193,   628,     0,       9,      0,      5   *SUBCHANNEL 21
  7925,  193,   650,     0,       9,      0,      5   *SUBCHANNEL 22
  7925,  193,   672,     0,       9,      0,      5   *SUBCHANNEL 23
  7925,   96,   694,     0,       9,      0,      3   *SUBCHANNEL 24
  7925,  150,   705,     0,       9,      0,      3   *SUBCHANNEL 25
  7925,   96,   722,     0,       9,      0,      3   *SUBCHANNEL 26
  7925,   96,   733,     0,       9,      0,      3   *SUBCHANNEL 27
  7925,  194,   744,     0,       9,      0,      4   *SUBCHANNEL 28
  7925,  194,   766,     0,       9,      0,      4   *SUBCHANNEL 29
  7925,  194,   788,     0,       9,      0,      4   *SUBCHANNEL 30
  7925,  114,   810,     0,       9,      0,      3   *SUBCHANNEL 31
```

The next request is for the subchannel number of the system disc (Logical Unit number 2). This is the disc on which the absolute code will be stored for execution. The response can be any one of the subchannel numbers assigned to the system. In this case, it is subchannel number 0, as follows:

```
   SYSTEM SUBCHNL?
   0                    * SYSTEM SUBCHANNEL
```

The generator asks if there is to be an auxiliary disc subchannel (Logical Unit number 3). You may respond with YES, NO, or a decimal value indicating the number of tracks to be allocated to the auxiliary disc. A YES response specifies that the auxiliary disc is on the same disc controller as the system disc, and a request will be made for subchannel number information. A NO response specifies that there is no auxiliary disc. A track count response indicates that the auxiliary disc is to consist of that number of tracks on a disc controller other than the one that supports the system disc, and a request will then be made for the model number of that disc. For this generation:

```
AUX DISC (YES OR NO OR # OF TRKS)?
YES                    * AUXILIARY DISC
```

The generator asks for the auxiliary subchannel number:

```
AUX DISC SUBCHNL?
12                     * AUXILIARY DISC SUBCHANNEL
```

Next, the generator requests the octal select code of the Time Base Generator:

```
TBG SELECT CODE?
10                     * TBG SELECT CODE
```

The next prompt asks for the octal select code of the Privileged Interrupt I/O card. In this example there is no card:

```
PRIV. INT. SELECT CODE?
0                      * PRIV. INT. SELECT CODE
```

The generator asks if TABLE AREA II and SDA should be included in the User Map for access by memory resident programs:

```
MEM. RES. ACCESS TABLE AREA II?
YES                    * MEM. RES. ACCESS TABLE AREA II
```

Next, the generator asks if any program is allowed to lock itself into the real-time area and/or into the background area:

```
RT MEMORY LOCK?
YES                    * RT MEMORY LOCK

BG MEMORY LOCK?
YES                    * BG MEMORY LOCK
```

Next, the amount of swap delay time is requested. This requires the entry of a decimal value representing tens of milliseconds in the range of 0 through 255. In this example:

```
SWAP DELAY?
50                     * SWAP DELAY
```

The generator asks for the physical memory size in decimal pages:

```
MEM SIZE?
512                    * MEMORY SIZE
```

The last prompt in this phase requests the name of the file, or the logical unit number of the device that will receive the bootstrap loader. In this example no bootstrap loader is to be produced:

```
BOOT FILE NAMR?
0                      * BOOT FILE NAMR
```

Program Input Phase

During this phase the generator accepts commands that directs it to the files containing the relocatable modules to be included in the new system. The generator issues a heading that announces the beginning of this phase. The heading is followed by a hyphen character (-) to prompt the entry of an operator command. The hyphen prompt is repeated after the acceptance of each command until you enter a /E to terminate the Program Input Phase. For this example the entries appear as follows:

```
PROG INPUT PHASE:          Introductory heading
-                          Command prompt
MAP ALL
-                          See the RT4GN listed output in Appendix F
LINKS IN CURRENT           for a complete list of command entries
-
REL,%CR4S1::SM             * RTE-IVB   OP SYS
-
REL.%CR4S2::SM             * RTE-IVB   OP SYS
    .
    .
    .
REL,%HELP::SM              * HELP PROGRAM
-
DISPLAY UNDEFS,TR          If answers supplied from an answer file,
                           would be useful to do a DISPLAY UNDEFS,TR
-
/E                         Terminate this phase

NO UNDEFS                  Generator message; no undefined
                           references exist
```

CAUTION

The value of all undefined externals will be set to zero upon exit from the Program Input Phase. Results are unpredictable if programs that were loaded during generation reference these externals.

Parameter Input Phase

During this phase you can modify the program type, priority, or execution interval, or you can modify the ENT record for any of the programs entered during the previous phase (undefined externals may be given a non-zero value). The generator displays the appropriate heading, after which you enter your changes. The heading is followed be a hyphen character (-) to prompt the entry of the parameter changes. The hyphen prompt is repeated after acceptance of each command until you enter a /E to terminate the parameter entry list.

First, the generator requests any parameter changes:

```
PARAMETERS              Introductory heading
-                       Command prompt
D.RTR,1,1
-
WHZAT,1,41
-
/E                      See the RT4GN listed output in Appendix F
                        for a complete list of entries
                        Terminate this list
```

Next, the generator asks if there are any entry (ENT) records that you wish to change:

```
CHANGE ENTS?            Introductory heading
-                       Command prompt
TAN,RP,105320
-
SQRT,RP,105321
-
ALOG,RP,105322
-
ATAN,RP,105323
-
COS,RP,105324
-
SIN,RP,105325
-
EXP,RP,105326
-
ALOGT,RP,105327
-
   .
   .
   .
-
DVSWP,RP,105473
-
/E
```

Table Generation Phase

The generator displays a heading to begin the Equipment Table entry portion of this phase. The heading is followed by a prompt asking for the first entry. This prompt is reissued following each of your entries until you terminate the entry list with a /E:

```
TABLE AREA I

EQUIPMENT TABLE ENTRY

EQT 01?
*
************************************
*******TABLE GENERATION PHASE*******
************************************
*
***********EQUIPMENT TABLE**********
*
11,DVR32,D                          * EQT 01 7925 DISC

EQT 02?
12,DVA05,B,X=13,T=12000             * EQT 02 SYSTEM CONSOLE (2645)

EQT 03?
13,DVA12,B,T=300                    * EQT 03 2631 LINE PRINTER

EQT 04?
14,DVR37,B,X=50,T=20000             * EQT 04 HPIB

EQT 05?
15,DVR23,B,D,T=9999                 * EQT 05 7970 MAG TAPE

EQT 06?
17,DVA05,B,X=13,T=12000             * EQT 06 2645 TERMINAL

EQT 07?
20,DVA05,B,X=13,T=12000             * EQT 07 2645 TERMINAL

EQT 08?
21,DVA05,B,X=13,T=12000             * EQT 08 2645 TERMINAL

    .
    .
    .

EQT 22?
/E
```

The next table is the Device Reference Table, which determines logical unit number assignments. The generator displays an introductory heading, followed by a prompt for the Equipment Table entry number (and optional subchannel specifications) to be associated with Logical Unit number 1. This prompt is reissued for each logical unit number until you terminate the entry list with a /E:

```
DEVICE REFERENCE TABLE

 001 = EQT #?
*
*******DEVICE REFERENCE TABLE**********
*
2                                 * LU 01 SYSTEM CONSOLE

 002 = EQT #?
1                                 * LU 02 SYSTEM DISC (SUBCHANNEL 0)

 003 = EQT #?
1,14                              * LU 03 AUX. DISC (SUBCHANNEL 14)

 004 = EQT #?
2,1                               * LU 04 LEFT CTU

 005 = EQT #?
2,2                               * LU 05 RIGHT CTU

 006 = EQT #?
3                                 * LU 06 2631 LINE PRINTER

   .                              See the RT4GN listed output
   .                              in Appendix F for a complete
   .                              list of entries.

 079 = EQT #?
/E                                Terminate this list
```

The next portion of this phase asks you for the Interrupt Table entries for each I/O card select code. The generator displays an introductory heading, after which you may enter the Interrupt Table information. The heading is followed by a hyphen character (-) to prompt the Interrupt Table entries. Except for I/O location 4 (the Power Fail card), the table entries must be in ascending order. The Interrupt Table entry list is terminated with a /E:

```
INTERRUPT TABLE                   Introductory heading
                                  Command prompt

-                                 Octal select code, option, destination
*
*****INTERRUPT TABLE*****
*
4,ENT,$POWR                       * POWER FAIL
-
```

```
11,EQT,1                        * 7925 DISC
-
12,PRG,PRMPT                    * SYSTEM CONSOLE
-
13,EQT,3                        * 2631 LINE PRINTER

   .
   .
   .

/E
```

System Boundaries Phase

After relocating the Table Area I modules, the generator reports (in decimal number of pages) the default size of the driver partitions and asks for any change:

```
DRIVR PART 00002
CHANGE DRIVR PART?
*
*******SYSTEM BOUNDARIES*******
*
0                                   * CHANGE DRIVER PART
                                      0 means there is no change in
                                      the driver partition size
```

Driver partition #1 and the Subsystem Global Area (SSGA) are loaded next. Then the generator reports the size (in decimal words) of the real-time COMMON areaand asks if you want to change the size:

```
RT COMMON 00000
CHANGE RT COMMON?
100                                 * CHANGE RT COMMON
```

Next, the generator reports the starting address of the real-time COMMON area:

```
RT COM ADD 12000
```

After aligning the end of background COMMON at the next page boundary, the generator reports the defaulted size of background COMMON:

```
BG COMMON 00924
```

The generator then asks if you want to change (in page increments) the size of the background COMMON area:

```
CHANGE BG COMMON?
1                                   * CHANGE BG COMMON
```

At this point, the generator reports the first word address of the background COMMON area:

```
BG COM ADD 12144
```

Next the generator reports the total size (decimal) of background COMMON:

```
BG COMMON 01448
```

System and Program Loading Phase

After loading the System Driver Area modules, the generator asks you to enter the number of Class I/O numbers to be allocated:

```
# OF I/O CLASSES?
*
*******RESOURCES TABLES
*
64                                    * # I/O CLASSES
```

The generator then asks you for the maximum number of LU commands you will allow to be referenced in a single job within the Batch-Spool Monitor (response to this question is derived from requirements described in the Batch-Spool Monitor Reference Manual):

```
# OF LU MAPPINGS?
10                                    * LU MAPPINGS
```

Next, the generator requests the number of resource numbers you will allow to be allocated:

```
# OF RESOURCE NUMBERS?
32                                    * # R.N.'S
```

Your response to the next question determines the lower and upper limits (in decimal words) for I/O buffering:

```
BUFFER LIMITS (LOW,HIGH)?
100,400                               * BUFFER LIMITS
```

Now, the generator gives the number of long ID segments used and asks that you enter the number of additional blank long (33-word) ID segments to be allocated in Table Area II for on-line program loading.

```
0030 LONG ID SEGMENTS USED
# OF BLANK ID SEGMENTS?
32                                    * BLANK ID SEGS
```

Then, the generator gives the number of short ID segments used and asks you to enter the number of additional blank short (9-word) ID segments to be allocated in Table Area II for on-line background segment loading:

```
0018 SHORT ID SEGMENTS USED
# OF BLANK SHORT ID SEGMENTS?
50                                  * SHORT ID SEGS
```

The generator gives the number of ID extensions used and asks you to enter the number of additional ID segment extensions to be allocated in Table Area II for on-line EMA program loading:

```
0000 ID EXTENSIONS USED
# OF BLANK ID EXTENSIONS?
4                                   * ID EXTENSIONS
```

The generator requests that you specify the maximum number of partitions to be defined for this generation:

```
MAXIMUM # OF PARTITIONS?
32                                  * PARTITIONS
```

Program loading continues with the appropriate linking and mapping (modules, globals, links) options in effect.

Table Area II modules, system modules, the configuration program, and the remaining partition-resident drivers are relocated to complete the system portion of program loading.

Next, the generator relocates the memory resident library followed by all memory resident programs. All real-time and background disc resident programs are then relocated.

Partition Definition Phase

This phase starts with a list of real-time program partition size requirements:

```
RT PARTITION REQMTS:
   AUTOR 02 PAGES
```

The generator then lists the background program partition size requirements (Type 4 BG programs are annotated with an "*"):

```
BG PARTITION REQMTS:
    .
    .
    .
COMPL 10 PAGES                    see Appendix F for complete listing
CLOAD 10 PAGES
READT 16 PAGES
WRITT 14 PAGES
HELP  05 PAGES
ACCTS 18 PAGES
LOADR 12 PAGES  *
```

The next report defines the largest addressable program sizes available (including base page):

```
MAXIMUM PROGRAM SIZE:
W/O COM 28 PAGES
W/  COM 26 PAGES
W/TA2   20 PAGES
```

Next, the generator reports the decimal size of System Available Memory (the generator automatically allocates to SAM that memory remaining at the end of Table Area I and that memory that was occupied by the reconfigurator program):

```
SYS AV MEM: 04019 WORDS
```

The generator then reports the number of the first physical memory page available for partitioning, and you are asked if you want to change this beginning page number in order to increase the size of SAM (in this example the page number is not changed, which results in no increase in the size of SAM):

```
ENTER 1ST PARTITION PAGE:  00047(DEFAULT) TO 00052:
TR,1
0
SYS AV MEM  04019 WORDS
```

The generator reports the decimal number of pages remaining for partitioning. This report is followed by a message telling you to define your partitions, and then a prompt is issued that asks for the first partition definition. This prompt is reissued after acceptance of each entry until you enter a /E to terminate the list.

If you define a partition whose size is larger than the maximum user logical address space, then the generator will prompt you for subpartitions, and you respond with a YES or NO.

```
PAGES REMAINING:  00081

DEFINE PARTITIONS                       Introductory heading

PART 01, 0468 PAGES?                    Command prompt
3,RT

PART 02, 0465 PAGES?
5,BG

PART 03, 0460 PAGES?
6,BG

PART 04, 0454 PAGES?
9,BG

      .                                 See the RT4GN listed output in
      .                                 Appendix F for a complete list
      .                                 of entries.

PART 30, 0000,(0050) PAGES?
25,S

PART 31, 0000,(0025) PAGES?
25,S

PART 32, 0000,(0000) PAGES?
/E                                      Terminate this list
```

Next you are asked if you want to modify page requirements. This query is followed by a hyphen character (-) to prompt the entry of page requirement modifications. The hyphen prompt is repeated after acceptance of each entry until you enter a /E to terminate the list.

```
MODIFY PROGRAM PAGE REQUIREMENTS?       Introductory heading
-                                       Command prompt
FMGR,15
-
LOADR,15
-
EDITR,11
-
/E
```

The next prompt asks if you want to assign any programs to a partition. The query is followed by a hyphen character (-) to prompt the entry of partition assignments. The hyphen prompt is repeated after acceptance of each entry until you enter a /E to terminate the list.

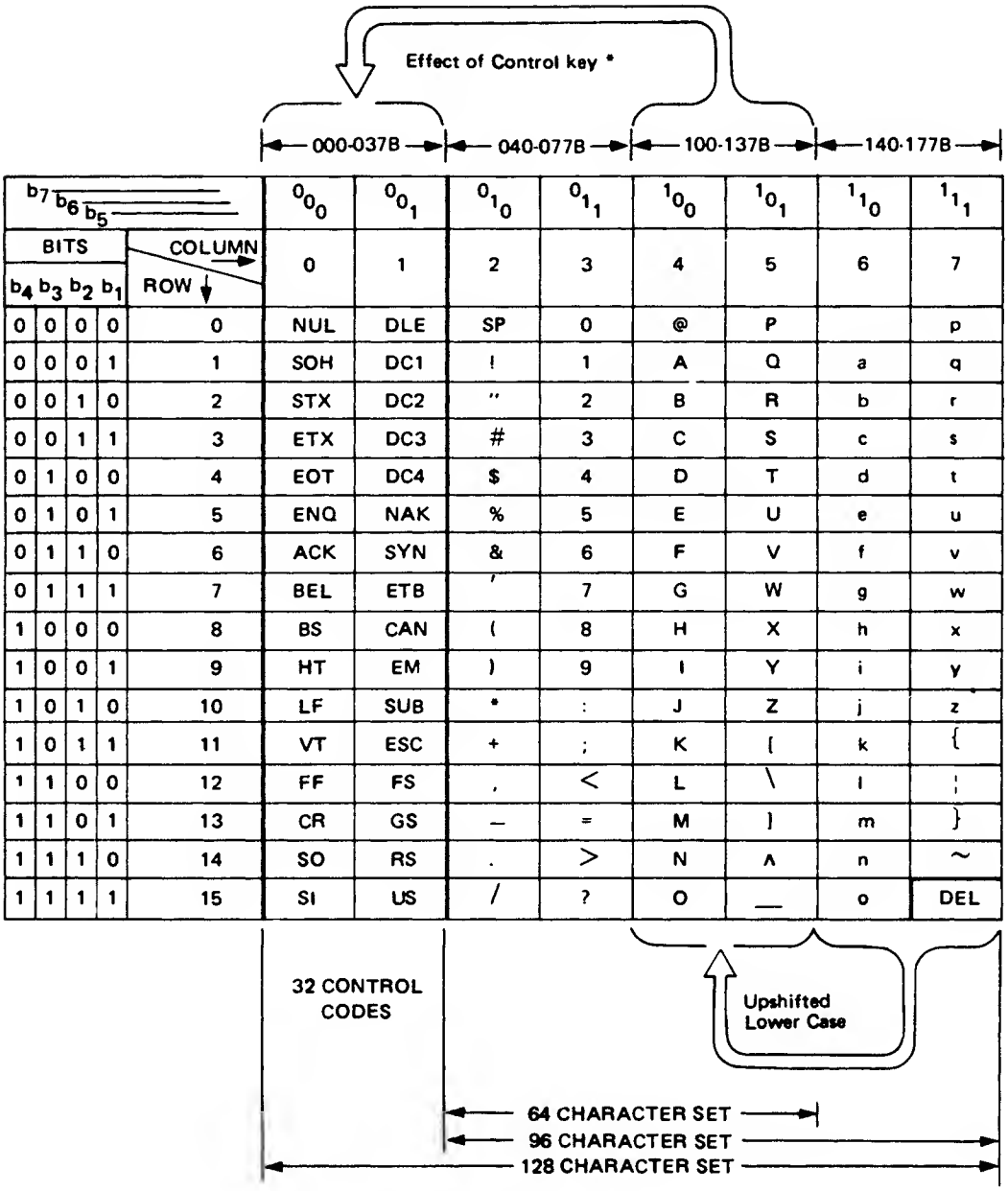
```
ASSIGN PROGRAM PARTITIONS?              Introductory heading
-                                       Command prompt
/E                                      Terminate this list
```

Finally the generator reports that your system is stored in the output file. This report is followed by a report of the system size in tracks and sectors (decimal) and the equivalent number of blocks. The number of errors encountered during the generation is also reported:

```
SYSTEM STORED IN FILE
SYS SIZE:053 TRKS, 047 SECS   (64 SECTORS/TRACK)
        =  03439 BLOCKS       (128 WORDS/BLOCK)

RT4GN FINISHED
0000 ERRORS
```

Appendix A
HP Character Set



b_7 b_6 b_5					0_0	0_1	0_{10}	0_{11}	1_0	1_1	1_{10}	1_{11}
BITS				COLUMN → / ROW ↓	0	1	2	3	4	5	6	7
b_4	b_3	b_2	b_1									
0	0	0	0	0	NUL	DLE	SP	0	@	P		p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	D	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	¦
1	1	0	1	13	CR	GS	–	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	^	n	~
1	1	1	1	15	SI	US	/	?	O	_	o	DEL

EXAMPLE: The representation for the character "K" (column 4, row 11) is.

	b_7	b_6	b_5	b_4	b_3	b_2	b_1
BINARY	1	0	0	1	0	1	1
OCTAL	1		1			3	

* Depressing the Control key while typing an upper case letter produces the corresponding control code on most terminals. For example, Control-H is a backspace.

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HEWLETT-PACKARD CHARACTER SET FOR COMPUTER SYSTEMS

This table shows HP's implementation of ANS X3.4-1968 (USASCII) and ANS X3.32-1973. Some devices may substitute alternate characters from those shown in this chart (for example, Line Drawing Set or Scandanavian font). Consult the manual for your device.

The left and right byte columns show the octal patterns in a 16 bit word when the character occupies bits 8 to 14 (left byte) or 0 to 6 (right byte) and the rest of the bits are zero. To find the pattern of two characters in the same word, add the two values. For example, "AB" produces the octal pattern 040502. (The parity bits are zero in this chart.)

The octal values 0 through 37 and 177 are control codes. The octal values 40 through 176 are character codes.

Decimal Value	Octal Values		Mnemonic	Graphic[1]	Meaning
	Left Byte	Right Byte			
0	000000	000000	NUL	$^{N}_{U}$	Null
1	000400	000001	SOH	$^{S}_{H}$	Start of Heading
2	001000	000002	STX	$^{S}_{X}$	Start of Text
3	001400	000003	ETX	$^{E}_{X}$	End of Text
4	002000	000004	EOT	$^{E}_{T}$	End of Transmission
5	002400	000005	ENQ	$^{E}_{Q}$	Enquiry
6	003000	000006	ACK	$^{A}_{K}$	Acknowledge
7	003400	000007	BEL		Bell, Attention Signal
8	004000	000010	BS	$^{B}_{S}$	Backspace
9	004400	000011	HT	$^{H}_{T}$	Horizontal Tabulation
10	005000	000012	LF	$^{L}_{F}$	Line Feed
11	005400	000013	VT	$^{V}_{T}$	Vertical Tabulation
12	006000	000014	FF	$^{F}_{F}$	Form Feed
13	006400	000015	CR	$^{C}_{R}$	Carriage Return
14	007000	000016	SO	$^{S}_{O}$	Shift Out } Alternate
15	007400	000017	SI	$^{S}_{I}$	Shift In } Character Set
16	010000	000020	DLE	$^{D}_{L}$	Data Link Escape
17	010400	000021	DC1	D_1	Device Control 1 (X-ON)
18	011000	000022	DC2	D_2	Device Control 2 (TAPE)
19	011400	000023	DC3	D_3	Device Control 3 (X-OFF)
20	012000	000024	DC4	D_4	Device Control 4 (TAPE)
21	012400	000025	NAK	$^{N}_{K}$	Negative Acknowledge
22	013000	000026	SYN	$^{S}_{Y}$	Synchronous Idle
23	013400	000027	ETB	$^{E}_{B}$	End of Transmission Block
24	014000	000030	CAN	$^{C}_{N}$	Cancel
25	014400	000031	EM	$^{E}_{M}$	End of Medium
26	015000	000032	SUB	$^{S}_{B}$	Substitute
27	015400	000033	ESC	$^{E}_{C}$	Escape[2]
28	016000	000034	FS	$^{F}_{S}$	File Separator
29	016400	000035	GS	$^{G}_{S}$	Group Separator
30	017000	000036	RS	$^{R}_{S}$	Record Separator
31	017400	000037	US	$^{U}_{S}$	Unit Separator
127	077400	000177	DEL	■	Delete, Rubout[3]

Decimal Value	Octal Values		Character	Meaning
	Left Byte	Right Byte		
32	020000	000040		Space, Blank
33	020400	000041	!	Exclamation Point
34	021000	000042	"	Quotation Mark
35	021400	000043	#	Number Sign, Pound Sign
36	022000	000044	$	Dollar Sign
37	022400	000045	%	Percent
38	023000	000046	&	Ampersand, And Sign
39	023400	000047	'	Apostrophe, Acute Accent
40	024000	000050	(	Left (opening) Parenthesis
41	024400	000051	)	Right (closing) Parenthesis
42	025000	000052	*	Asterisk, Star
43	025400	000053	+	Plus
44	026000	000054	,	Comma, Cedilla
45	026400	000055	-	Hyphen, Minus, Dash
46	027000	000056	.	Period, Decimal Point
47	027400	000057	/	Slash, Slant
48	030000	000060	0	} Digits, Numbers
49	030400	000061	1	
50	031000	000062	2	
51	031400	000063	3	
52	032000	000064	4	
53	032400	000065	5	
54	033000	000066	6	
55	033400	000067	7	
56	034000	000070	8	
57	034400	000071	9	
58	035000	000072	:	Colon
59	035400	000073	;	Semicolon
60	036000	000074	<	Less Than
61	036400	000075	=	Equals
62	037000	000076	>	Greater Than
63	037400	000077	?	Question Mark

Decimal Value	Octal Values		Character	Meaning
	Left Byte	Right Byte		
64	040000	000100	@	Commercial At
65	040400	000101	A	Upper Case Alphabet, Capital Letters
66	041000	000102	B	
67	041400	000103	C	
68	042000	000104	D	
69	042400	000105	E	
70	043000	000106	F	
71	043400	000107	G	
72	044000	000110	H	
73	044400	000111	I	
74	045000	000112	J	
75	045400	000113	K	
76	046000	000114	L	
77	046400	000115	M	
78	047000	000116	N	
79	047400	000117	O	
80	050000	000120	P	
81	050400	000121	Q	
82	051000	000122	R	
83	051400	000123	S	
84	052000	000124	T	
85	052400	000125	U	
86	053000	000126	V	
87	053400	000127	W	
88	054000	000130	X	
89	054400	000131	Y	
90	055000	000132	Z	
91	055400	000133	[	Left (opening) Bracket
92	056000	000134	\	Backslash, Reverse Slant
93	056400	000135	]	Right (closing) Bracket
94	057000	000136	^ ↑	Caret, Circumflex; Up Arrow[4]
95	057400	000137	_ ←	Underline, Back Arrow[4]

Decimal Value	Octal Values		Character	Meaning
	Left Byte	Right Byte		
96	060000	000140	`	Grave Accent[5]
97	060400	000141	a	Lower Case Letters[5]
98	061000	000142	b	
99	061400	000143	c	
100	062000	000144	d	
101	062400	000145	e	
102	063000	000146	f	
103	063400	000147	g	
104	064000	000150	h	
105	064400	000151	i	
106	065000	000152	j	
107	065400	000153	k	
108	066000	000154	l	
109	066400	000155	m	
110	067000	000156	n	
111	067400	000157	o	
112	070000	000160	p	
113	070400	000161	q	
114	071000	000162	r	
115	071400	000163	s	
116	072000	000164	t	
117	072400	000165	u	
118	073000	000166	v	
119	073400	000167	w	
120	074000	000170	x	
121	074400	000171	y	
122	075000	000172	z	
123	075400	000173	{	Left (opening) Brace[5]
124	076000	000174	|	Vertical Line[5]
125	076400	000175	}	Right (closing) Brace[5]
126	077000	000176	~	Tilde, Overline[5]

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Notes [1]This is the standard display representation. The software and hardware in your system determine if the control code is displayed, executed, or ignored. Some devices display all control codes as "|", "@", or space.

[2]Escape is the first character of a special control sequence. For example, ESC followed by "J" clears the display on a 2640 terminal.

[3]Delete may be displayed as "__", "@", or space.

[4]Normally, the caret and underline are displayed. Some devices substitute the up arrow and back arrow.

[5]Some devices upshift lower case letters and symbols (` through ~) to the corresponding upper case character (@ through ^). For example, the left brace would be converted to a left bracket.

RTE SPECIAL CHARACTERS

Mnemonic	Octal Value	Use
SOH (Control A)	1	Backspace (TTY)
EM (Control Y)	31	Backspace (2600)
BS (Control H)	10	Backspace (TTY, 2615, 2640, 2644, 2645)
EOT (Control D)	4	End-of-file (TTY 2615, 2640, 2644, 2645)

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Appendix B
RTE-IVB Memory Organization

PHYSICAL MEMORY ORGANIZATION

Physical Memory in the RTE-IVB system is divided into areas for the system, memory resident programs, driver partitions, and a series of partitions used for execution of disc resident programs.

Physical memory is organized as shown in Figure B-1. The organization is fixed, although relative sizes of the areas depend on installation needs. Some areas (e.g., COMMON) will not exist in all systems. The user determines the driver partition size, the size of System Available Memory, the size of each disc resident partition, the size of COMMON, and the size and composition of the resident library and memory resident program area. The size of physical memory depends on the hardware supplied. RT4GN can configure a system from 48 to 1024 (decimal) pages long.

The various components in physical memory are described below.

SYSTEM BASE PAGE---The system base page contains the system communication area which is used by the system to define request parameters, I/O tables, scheduling lists, operating parameters, memory bounds, etc. System links, upper base page links (which include table area links, SSGA links, and driver links), and trap cells are also located on the system base page. For a description of links and how they are used, refer to Step 16b in Chapter 2.

TABLE AREA I---This area of memory includes the system Track Map Table, EQT's, Driver Map Table, Device Reference Table (DRT), Interrupt Table, some system entry points (refer to the RTE-IVB Programmer's Reference Manual), and all Type 15 modules. The unused space between the Table Area I modules and the start of the driver partition is allocated to SAM.

SYSTEM AVAILABLE MEMORY (SAM)---SAM is a designated area of memory set aside to satisfy temporary memory requirements. Reentrant subroutine ID tags, reentrant I/O, automatic buffering to I/O device, and many other system features require blocks of memory to be made available. Blocks of SAM are allocated as required by the system to satisfy these temporary needs. The amount of SAM required depends on specific applications. Subsystems (communications, spooling, etc.) may place additional requirements on this areas. For more information regarding SAM, refer to Chapter 2, Step 33. In physical memory, SAM exists in three blocks. The first block occupies the area from the end of Table Area I to the start of the next physical page. The other two blocks are described below.

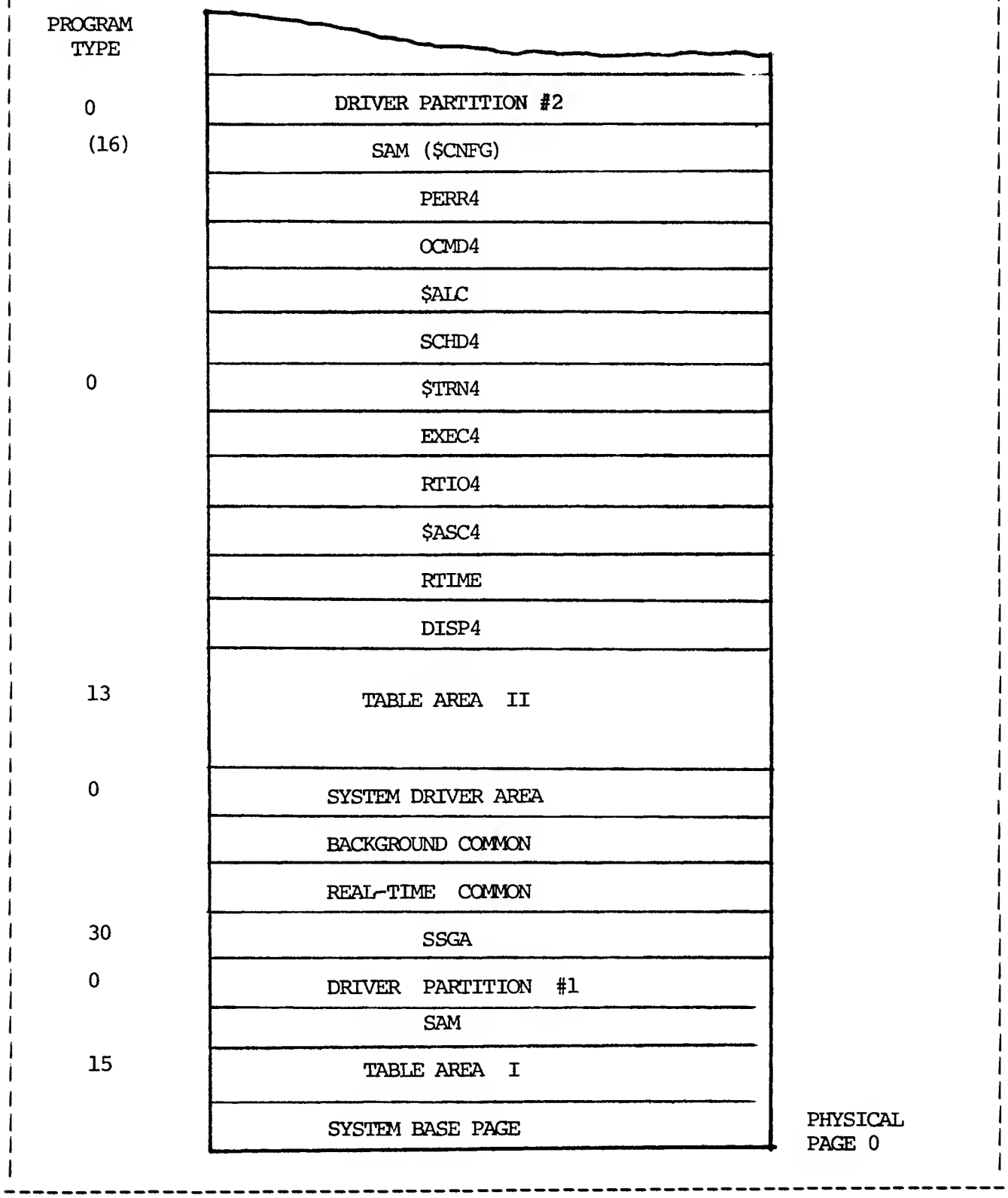


Figure B-1. RTE-IVB Physical Memory Configuration

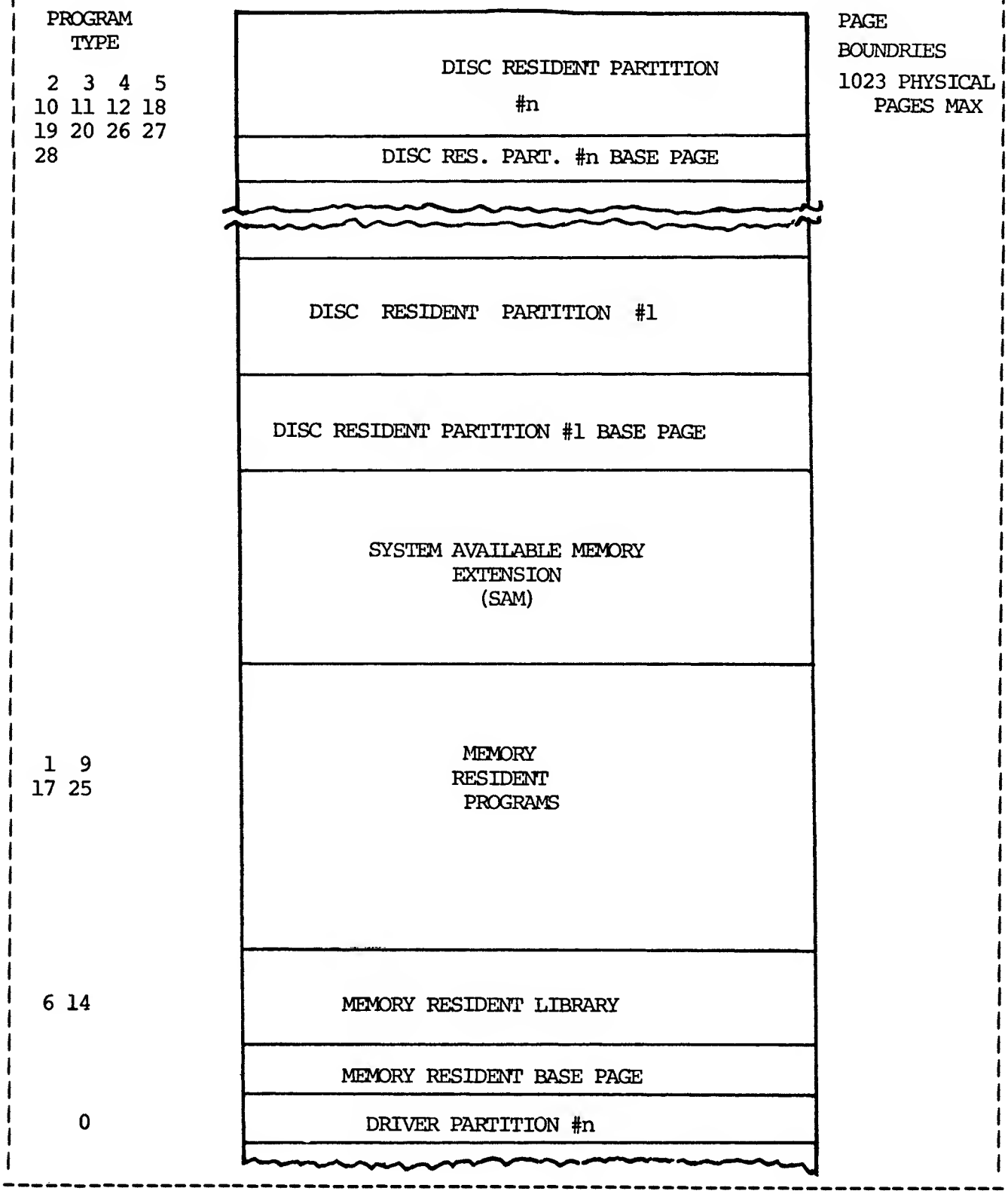


Figure B-1. RTE-IVB Physical Memory Configuration (Cont.)

DRIVER PARTITION #1---Driver partition #1 will always contain the driver for the system disc. It may also contain as many other drivers as will fit into the remaining space. The default driver partition size is two pages, which is large enough for all HP drivers. The default value may be changed during generation (refer to Chapter 2, Step 23).

SSGA---The Subsystem Global Area is used by HP subsystems to share common tables and programs. It contains modules accessed by their entry point rather than through common declarations. SSGA will contain all Type 30 modules loaded at generation time. Only those modules declaring SSGA (Types 17-20, 25-28) can access it.

REAL-TIME COMMON---The Real-Time COMMON area is used to share data between real-time, memory resident, and (optionally) background programs. The user has the option of increasing this amount during generation to accommodate future programs loaded on-line (see Step 23 in Chapter 2).

BACKGROUND COMMON---The background COMMON area is used to share data between background and (optionally) real-time and memory resident programs. The end of the background COMMON area is automatically extended to the next page boundary, making use of otherwise wasted space. The user has the option of adding additional memory (in page increments.) to this area. Refer to Step 24, in Chapter 2.

CAUTION

> Do not confuse the system COMMON areas described above with the local COMMON area which may be specified for a program loaded on-line. The local COMMON area precedes the program (i.e., it will be in the program's partition.) and is accessible only to that program, its subroutines, and its segments. Any programs that you want to use local COMMON cannot be relocated by the generator.

SYSTEM DRIVER AREA---The System Driver Area (SDA) contains all non-partition resident drivers. This category typically includes privileged drivers, very large drivers, or drivers that do their own mapping.

TABLE AREA II---Table Area II contains system tables, some system entry points and all type 13 modules. The following system tables are included in Table Area II: class table, batch LU switch table, resource number table, long ID segments, short ID segments, ID extensions, partition definition table, and track allocation table. The sizes of these tables are primarily determined from the responses given during the relocation and system loading phases (refer to Steps 16 and 17 in Chapter 2).

OPERATING SYSTEM---This area contains all the type 0 operating system modules. The operating system is composed of the following components:

DISP4 This component dispatches programs for execution. Program execution is controlled according to the scheduled list (maintained by SCHED). DISP4 will determine the partition in which the program will execute, and if necessary, initiate disc swapping. Other functions performed by DISP4 are to set up the user map and memory protect fence before program execution, set up the partition list ($MATA) at initialization, and to coordinate the clean up of system resources when programs are aborted.

RTIME RTIME is a real time clock processor that handles all time dependent functions. The major functions performed by RTIME are:

* Increment real time clock values every 10 milliseconds.
* Schedule programs on the time list.
* Add programs to the time list.
* Retrieve current system time for EXEC 11 requests.
* Start TBG at initialization or after a power fail.
* Process device time outs.
* Process batch time outs.

$ASC4 The $ASC4 module contains system ASCII message strings.

RTIO4 The RTIO4 module controls all system peripheral input and output operations. It routes I/O interrupts to the appropriate drivers and system processors. I/O requests are made to RTIOC either by EXEC calls from user programs or by system I/O calls from other parts of the operating system. RTIO4 also sets up the maps and base page communication area before calling drivers.

EXEC4 EXEC4 is the system module that interfaces user program requests to the Operating System. Specific functions performed by EXEC are:

* Provides for general checking and examination of EXEC call requests and calls the appropriate processing routine. Provides memory protect violation control.
* Processes privileged and reentrant subroutines.
* Manages disc track allocation and release.
* Handles general error messages and program abort.

$TRN4 $TRN4 is the system resource number (RN) deallocation routine. It is called by the dispatcher (DISP4) whenever a program completes. Its function is to release any local locks and any local RN allocations the program has. It also releases any LU locks the program has.

SCHD4 SCHD4 handles program state transitions, responds to operator input commands, initiates system start-up at bootup, and satisfies or passes to other procesors eleven EXEC calls (6 through 12, 14, and 22 through 24).

$ALC The $ALC module allocates blocks of SAM to the processors requesting temporary memory. The $RTN routine (within $ALC) returns memory no longer needed to SAM.

OCMD4 This module provides execution of the following system commands:

LU,P1[,P2[,P3]]	LU status and LU change
EQ,P1[,P2]	EQT status and buffering change
TO,P1[,P2]	Show timeout or change timeout

PERR4 This is a parity error module that reports parity errors detected by the hardware and continues operation of the system if possible. PERR4 tries to reproduce parity errors to detect hardware errors. If hardware errors are detected, PERR4 brings down the partition in which the error was generated.

SYSTEM AVAILABLE MEMORY ($CNFG)---This is the second block of SAM which starts immediately after the system and is approximately 2.5 pages in size. During boot-up and reconfiguration, this area is occuppied by the RTE reconfiguration module $CNFG.

DRIVER PARTITIONS #2 THROUGH #N---The number of driver partitions depends on the size and number of drivers relocated as partition resident. The default driver partition size is two pages, which is large enough for all HP drivers. The generator attempts to fit as many drivers as will fit into a driver partition before allocating space for additional partitions.

MEMORY RESIDENT BASE PAGE---The memory resident base page contains all memory resident program links, all memory resident library links, upper base page links, and the system communications area.

MEMORY RESIDENT LIBRARY---The memory resident library contains common subroutines that may be accessed by more than one memory resident program. Placing a subprogram (or subroutine) in this area means that it will not be appended to memory resident programs that call it. However, it is subject to special design constraints so that two programs will not inadvertently gain concurrent access. Only memory resident programs can access routines in the memory resident library.

MEMORY RESIDENT PROGRAM AREA---This is the area in memory where programs are always resident (i.e., they are not swapped out to the disc). It is intended for high priority tasks that require quick response time to real-time conditions and that cannot afford disc load time, and for small programs that are used frequently.

SYSTEM AVAILABLE MEMORY EXTENSION---This is the third block of SAM in physical memory. The SAM extension is optional, with its size specified by increasing, in page increments, the page number where the disc resident partitions start.

PROGRAM PARTITIONS---The number of pages remaining after the SAM extension must be divided into program partitions (maximum of 64). Each partition must be at least two pages long -- one page to be used as a base page and the remainder for the program. The number and size of partitions are specified during generation. The partition definitions may be later changed by the use of the reconfigurator. Each disc resident base page contains the system communication area, upper base page links, and that disc resident program's links (see Step 16a in Chapter 2).

LOGICAL MEMORY ORGANIZATION

In order to better understand the concept of logical memory, you should be familiar with the description of the dynamic mapping system given in the 21MX Computer Series Reference Manual.

Logical Memory is the 32K word (maximum) address space described by the currently enabled memory map. A memory map can be defined as 32 hardwire registers that provide the interface between physical memory and the 32K word logical memory. The four memory maps (System, User, Port A, and Port B) provide the capability of addressing memory configurations of more than 32K words. Note that all memory map addressing is done internally by the system and is transparent to the user. The four possible logical map configurations is shown in Figure B-2. A discussion of these configurations follows:

SYSTEM MAP---Figure B-3 shows a sample system logical map configuration. Note that while SAM exists in three areas in physical memory, in logical memory SAM exists in two blocks. The first block follows the list Table Area I modules, and the second block starts immediately after the system. The second block will include the area occupied by the reconfiguration module at bootup and the SAM extension.

NOTE

The driver partition included in the system and user logical maps will vary. The system will map a driver partition into the system map whenever a driver needs access to a buffer in

the system area (i.e., SAM). Driver partitions are mapped into the user address space whenever a driver needs access to a buffer inside a programs partition.

MEMORY RESIDENT MAP---Figure B-4 shows the logical map configuration for the memory resident program area. The System Driver Area and Table Area II will be included in this map if so specified at generation (see Step 11 in Chapter 2).

REAL TIME AND BACKGROUND MAP---A sample map for a RT or BG program (Type 2 and 3) is illustrated in Figure B-5 . The System Driver Area; Table Area II , and System COMMON Area, are always included in this map.

LARGE BACKGROUND PROGRAM MAP---Figure B-6 illustrates a sample large background (Type 4) program map. Note that the System Driver Area and Table Area II are not included in this map, thus potentially allowing for more program space. The system COMMON area will be included only in the maps of those large background programs that access it.

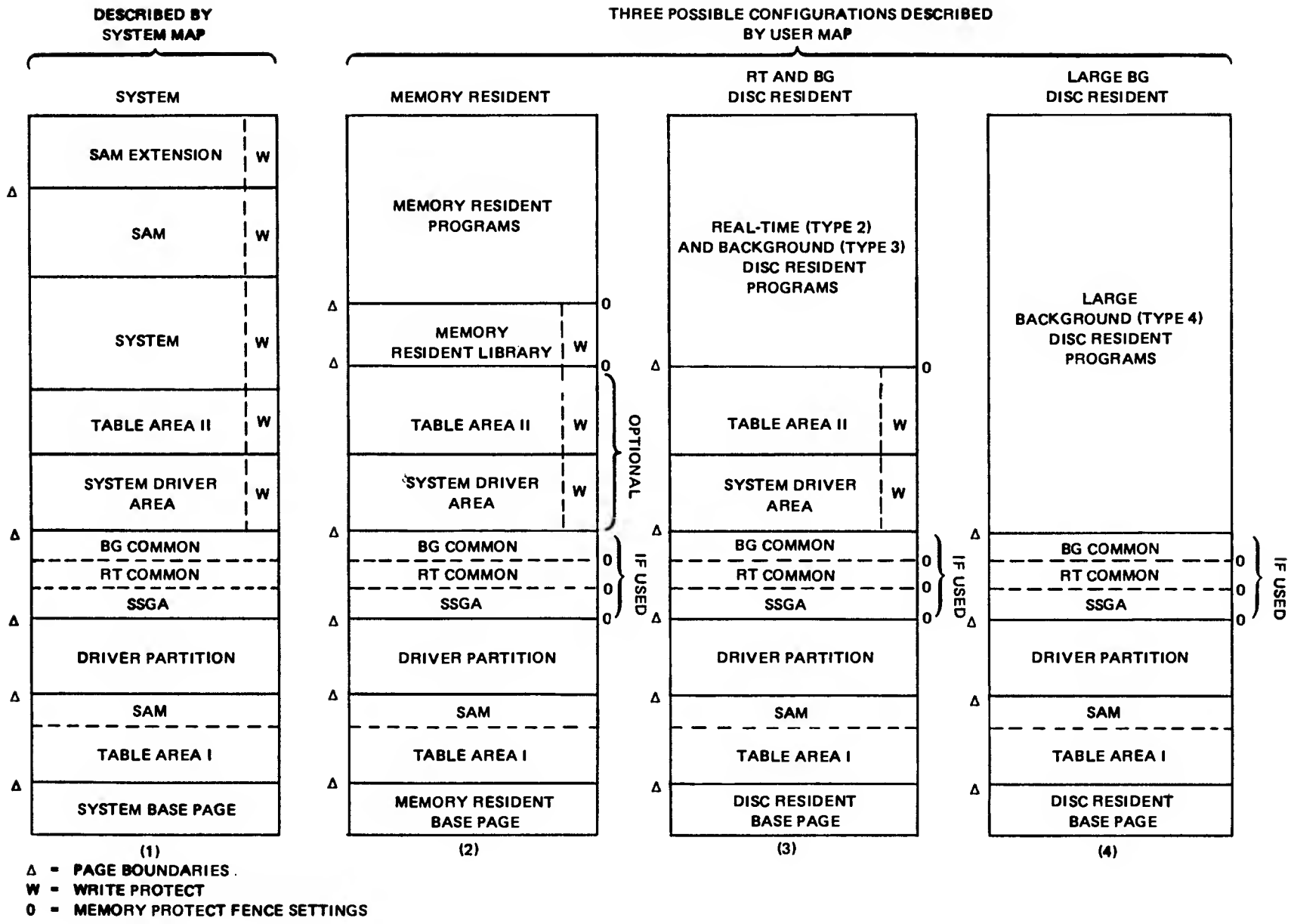


Figure B-2. RTE-IVB 32K Logical Memory Configurations

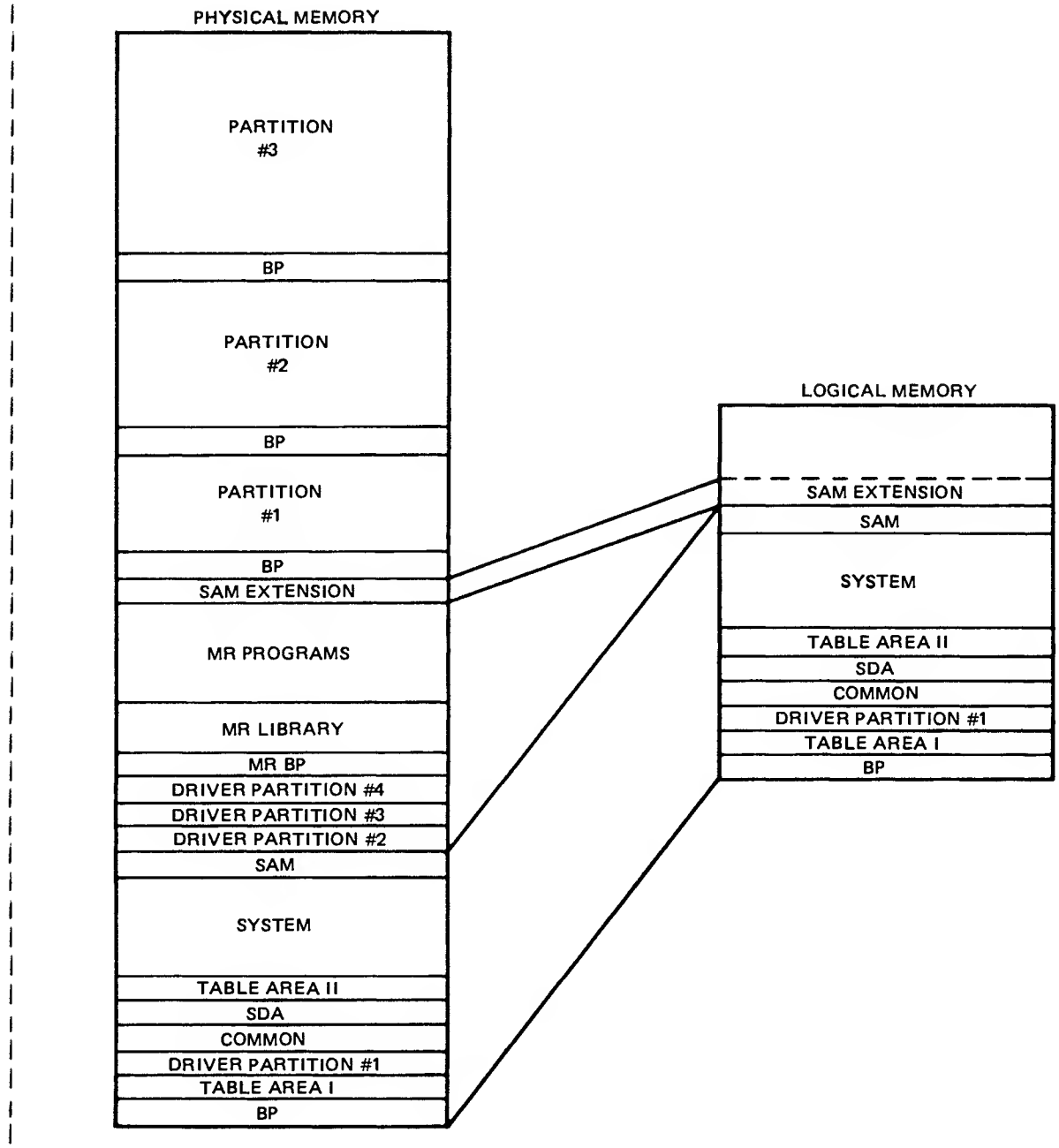


Figure B-3. Sample System Map

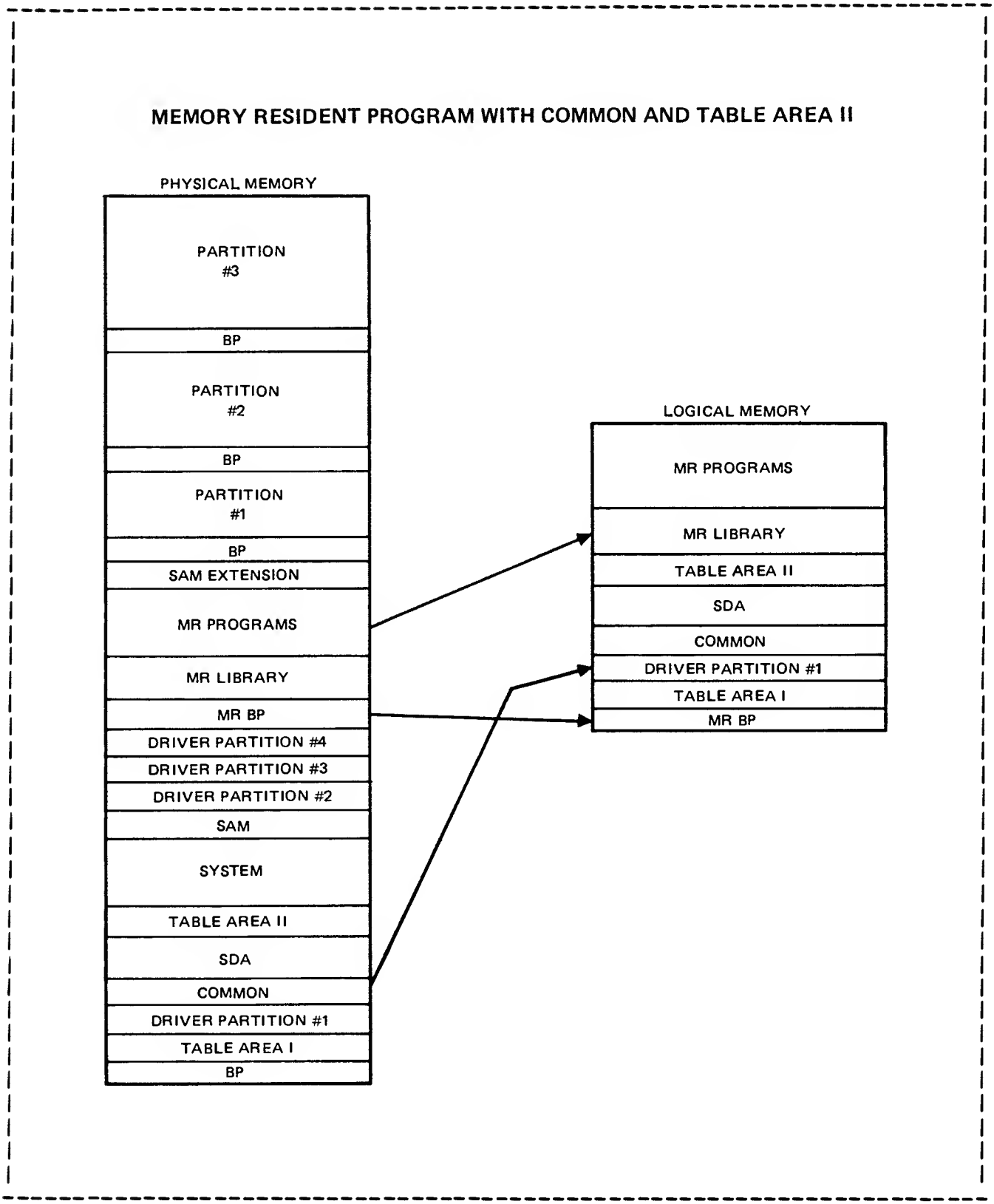


Figure B-4. Sample User Map (Mem Res Program With Common)

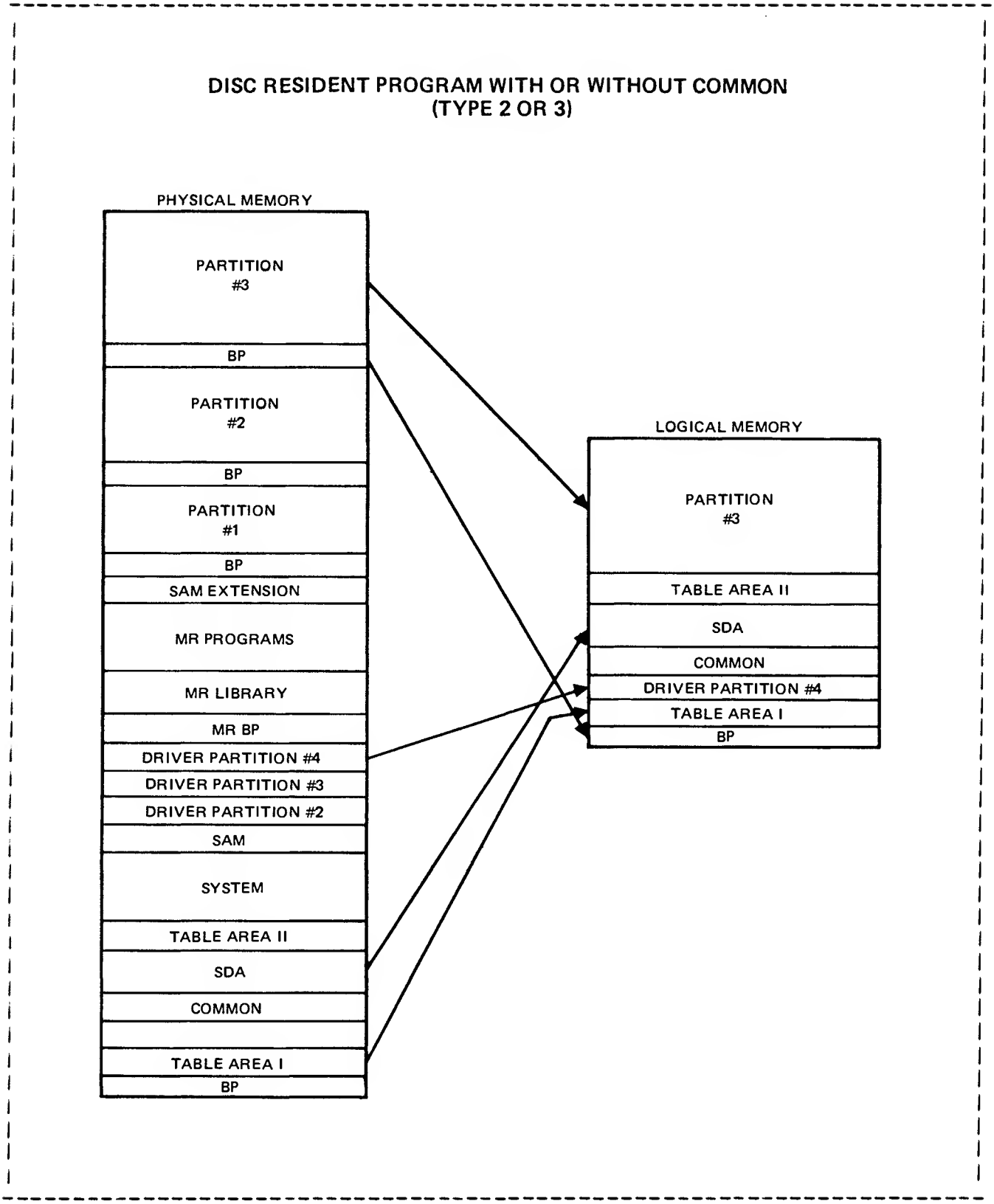


Figure B-5. Sample User Map (Disc Resident Program)

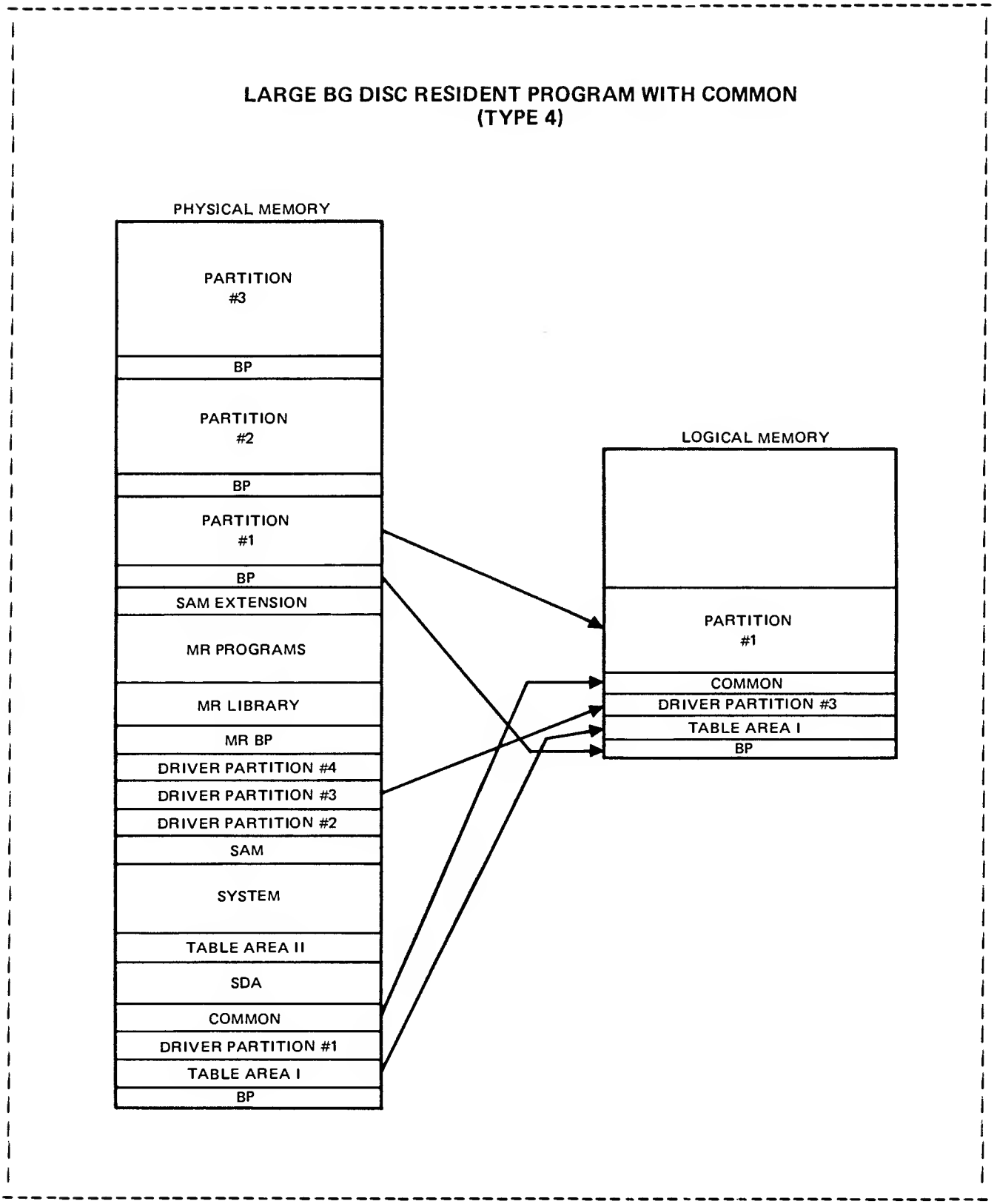


Figure B-6. Sample User Map (BG Disc Res Program With Common

BASE PAGE MAPPING AND ORGANIZATION

The base page fence (refer to the 21MX Computer Series Reference Manual) is automatically set by RTE-IV for all user base pages so that the top portion of the base page will contain the system communication area and upper base page links, and the bottom portion will contain the user program's links. The DMS hardware will map base page references above the fence to the system base page and map reference below the fence to the particular user base page operating at the time. (This mapping nas no effect when the System Map is enabled.)

Figure B-7 illustrates the logical base page configuration of the system, memory resident programs, and disc resident programs.

Figure B-8 illustrates the base page mapping scheme for a partition resident program.

The upper base page linkage area and system communication areas are available to all programs for read only access. The size of the system communication area is fixed. The size of upper and lower base page linkage areas will vary with the number of program page crossings, which may cause indirect links to be generated on the base page. The LINKS IN CURRENT command (see Step 16b in Chapter 2) can be specified to reduce the number of base page links used during program relocation. The user has no direct control over the allocation of the base page area. Linkages are allocated as needed during generation. As an aid in generation, RT4GN will optionally trace the allocation of links, program by program, via the MAP LINKS command.

MEMORY PROTECTION

Memory protection between disc resident program partitions and between disc and memory resident programs is provided by the dynamic mapping system. A program cannot access a user page that is not included (eitner directly or through a DCPC transfer) in its logical memory. Since many programs will not use all of the possible 32K logical area, unused logical pages above the program are read/write protected. It is possible for a user to read from system logical memory via cross-map loads, but the system is write protected.

A different form of protection is required for the driver partition and for Table Area I since these areas exist in the user's addressing space. The memory protect fence provides this protection by preventing stores and jumps to locations below a specified address. All possible fence positions are shown in Figure B-9.

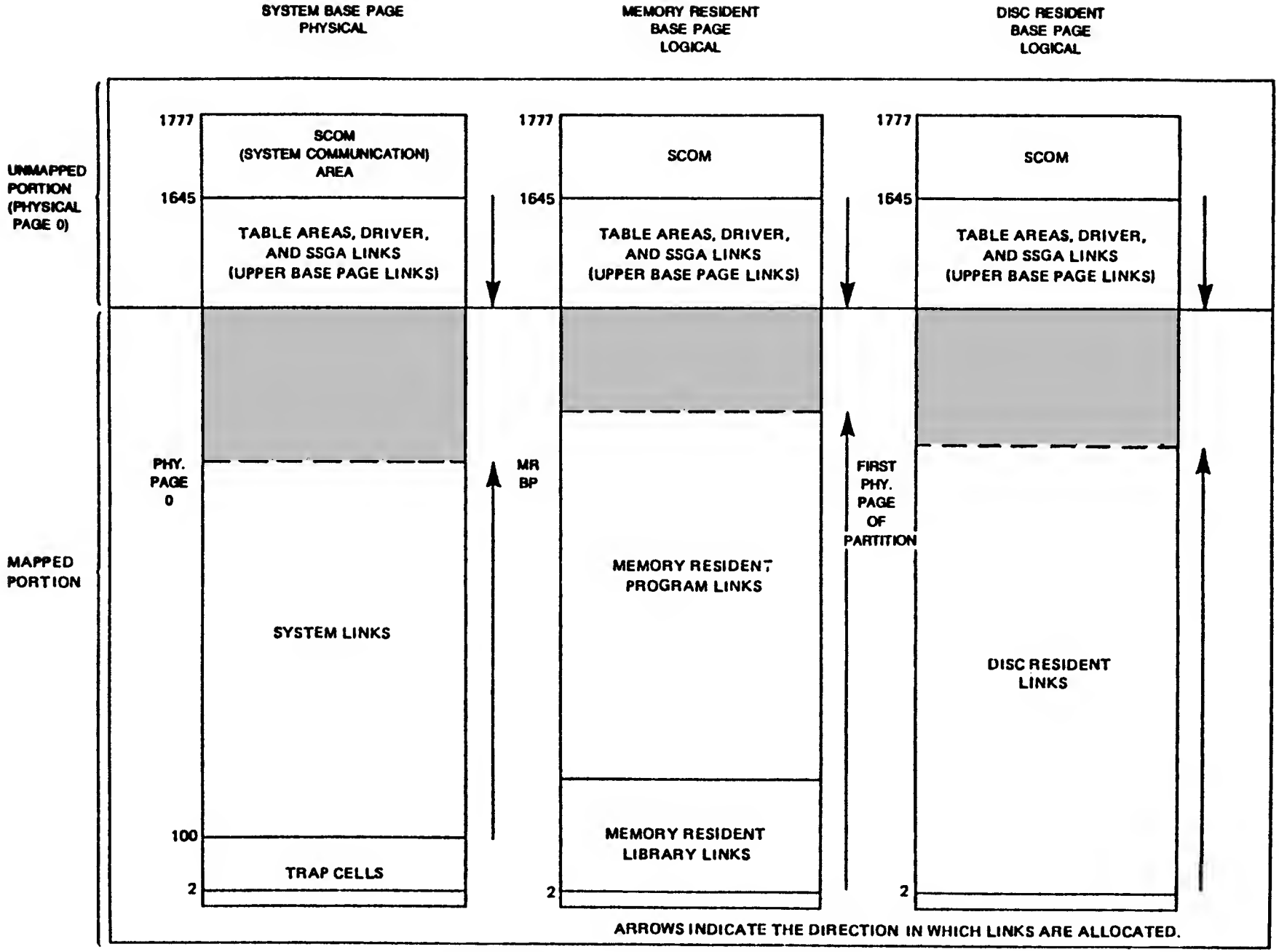


Figure B-7. System Base Pages

USER LOGICAL BASE PAGE

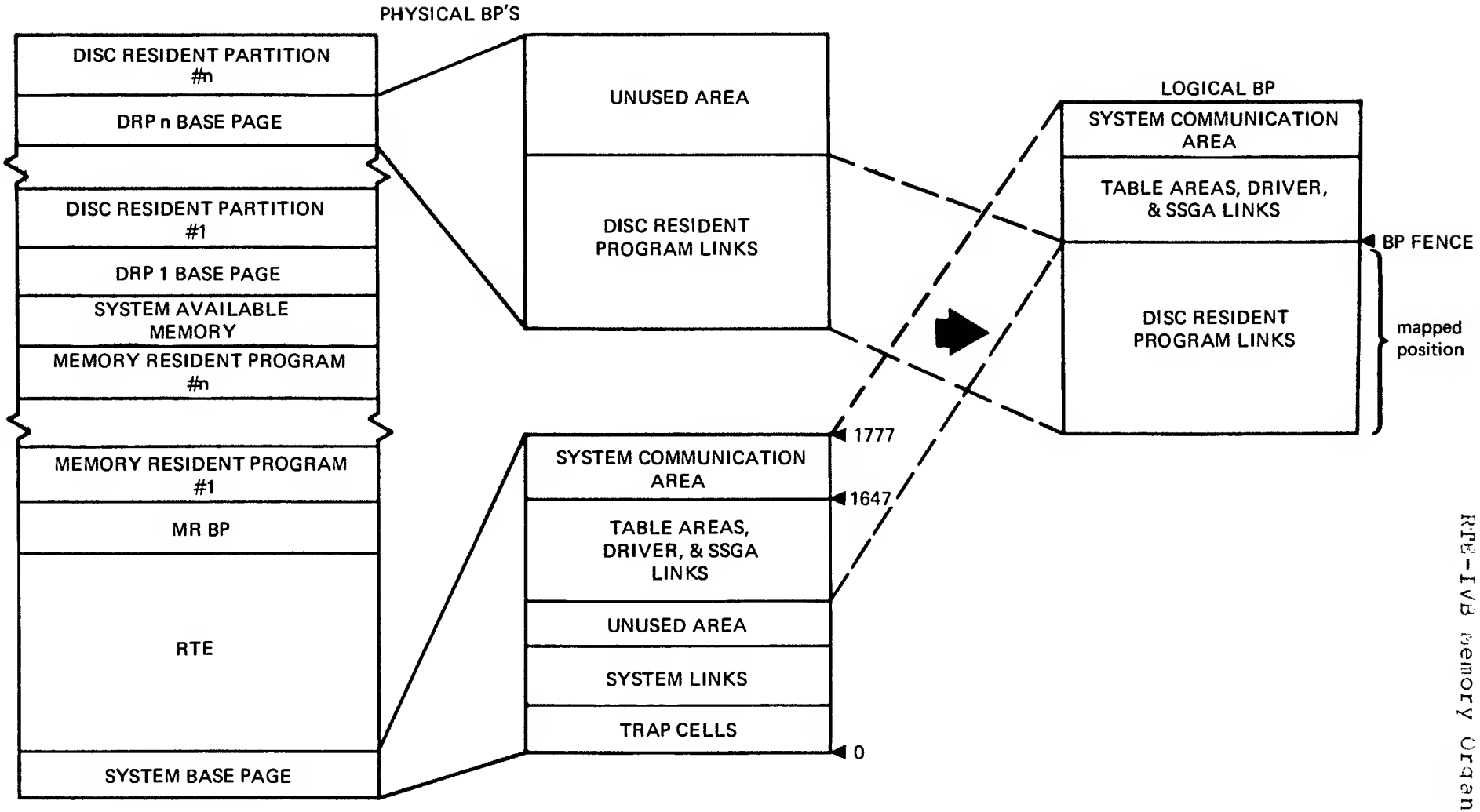


Figure B-8. User Logical Base Page

The memory protect fence applies to the logical address space, and addresses are compared to the fence before translation. If a disc resident program does not use any of the COMMON areas, the memory protect fence is set at the bottom of the program area. For a memory resident program not using COMMON, the memory protect fence is set above the memory resident library area until a memory resident library routine is executed, in which case the memory protect fence setting is placed below the memory resident library area.

For programs using COMMON, all of COMMON is mapped and the fence is set at one of three possible locations, depending on the portion of COMMON being used. Figure B-9 expands the COMMON area and shows the three fence settings: A, B, and C.

GENERATOR RELOCATION GUIDELINES

The following paragraphs describe the generator procedures when relocating various system components.

TABLE AREA I MODULES - These are Type 15 modules loaded into Table Area I, in addition to some entry points and the system I/O tables stored there by the generator. Table Area I is loaded sequentially above the system base page. Base page links are allocated downward below the system communication area and are included in the system and all user base pages.

PARTITION RESIDENT DRIVERS - These are Type 0 modules whose EQT entries did not include the "S" or "M" options specifying System Driver Area. The starting relocation address of the first driver in each partition is word 0 of the logical page following Table Area I. Driver partition #1 is required to have the system disc driver in it

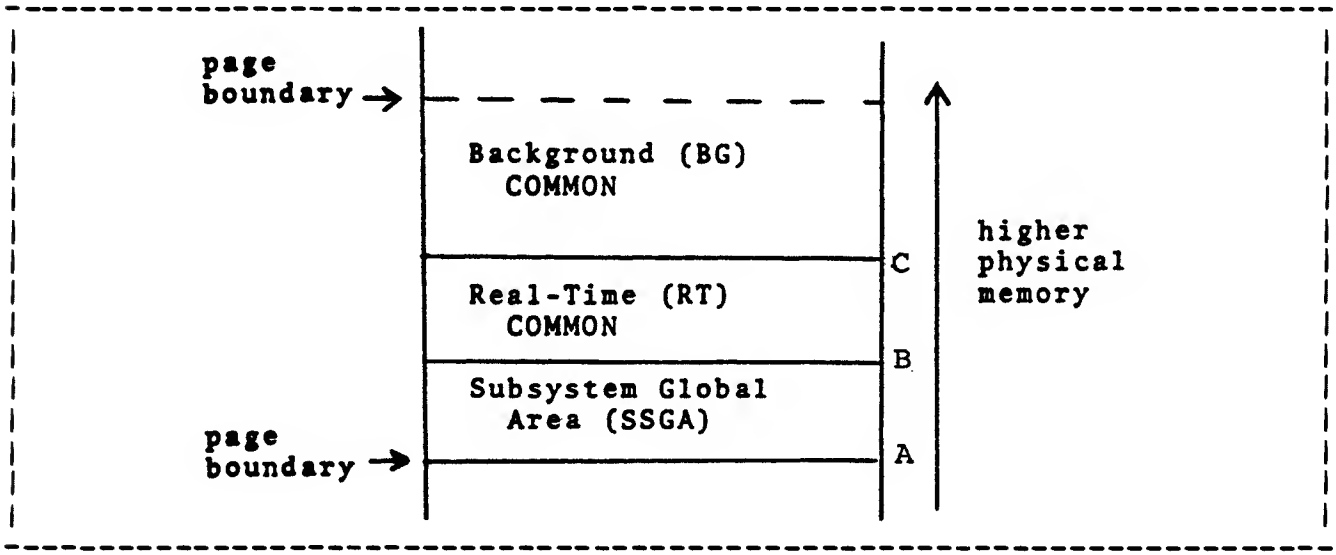


Figure B-9. Memory Protect Fence Locations For Programs.

for reconfiguration purposes. Base page links are allocated downward below the Table Area links and are included in all system and user base pages.

The generator attempts to optimize the relocation of drivers into driver partitions. After the first driver is relocated into a partition, a scan is made of the module symbol table, searching for the next unrelocated partition- resident driver that is small enough to fit into the remainder of that partition. The scan starts at the beginning of the table, and the first driver that fits will be relocated. The process is repeated after the relocation of each driver until no drivers are found that are small enough to be relocated into the remaining driver partition space. Should a driver overflow the partition (because of subroutines appended during relocation), backup will be done over that driver. The generator scans to see if there are any other drivers left that will fit, and the above process is repeated. The driver causing the overflow will be re-relocated into a subsequent driver partition.

SUBSYSTEM GLOBAL AREA (SSGA) - These are Type 30 modules loaded sequentially into COMMON. The starting address of COMMON (& SSGA) is word 0 of the logical page following the driver partition. Base page links are allocated downward below the driver partition #1 links and are included in all system and user base pages.

SYSTEM DRIVER AREA (SDA) - These are Type 0 modules whose EQT entries specified the "S" or "M" option. The starting address of SDA is word 0 of the logical page following COMMON (if any). Base page links are allocated downward below the SSGA links and are included in the system and all user base pages.

TABLE AREA II MODULES - These are Type 13 modules loaded into Table Area II, in addition to some entry points and the system tables built by the generator. Table Area II is loaded sequentially above the System Driver Area. Base page links are allocated downward below the SDA links and are included in the system and all user base pages.

SYSTEM MODULES - These are all remaining Type 0 modules (EXEC, RTIOC, SCHED, etc.) and are loaded sequentially above Table Area II. Base page links for these modules are allocated upward from location 100 in the system base page toward the Table Area, SSGA, and driver links.

The reconfiguration module is loaded sequentially after the Type 0 system modules. The memory area occupied by this module will become part of System Available Memory after the reconfiguration has been completed. Base page links for this module follow the system links in the system base page.

MEMORY RESIDENT LIBRARY MODULES - These are Type 6 and 14 modules (reentrant, privileged, and force-loaded) for use by memory resident programs only. If memory resident programs requested Table Area II access, then the library area is loaded sequentially starting at word 0 of the logical page following Table Area II. Otherwise the library is loaded sequentially at word 0 of the logical page at or following COMMON. Base page links for library modules are allocated upward in the memory resident base page, starting at location 2.

MEMORY RESIDENT PROGRAMS - These programs are loaded sequentially starting at the first logical page following the resident library. The first two words of each memory resident program area are reserved to save index registers in the event that the program is interrupted. Base page links for these programs are allocated upward in the memory resident base page above the library links. The highest available link address is the word before the lowest driver link in the upper BF links area.

DISC RESIDENT PROGRAMS - These RT and BG programs are relocated into logical memory and stored on the disc. Each program starts at word 34 of the logical page following Table Area II. The first two words of the page are reserved to save index registers in the event that the program is interrupted; the next 32 words save the DMS map registers in case of a program swap. Both RT and BG programs can be segmented. Base page links are allocated upward from location 2 of the user base page. The highest available link address is the word before the lowest driver link. These links are written on the disc and are referred to as the user base page. This user base page is swapped with the program into memory and placed into the first page of the selected partition.

All real-time and Type 3 background programs have the memory area occupied by Table Area I through Table Area II included in their logical address space.

Note that references to system entry points defined in Type 0 modules will be allowed for only Type 3 background programs (for use by HP subsystem modules).

TYPE 4 BACKGROUND DISC RESIDENT PROGRAMS WITHOUT COMMON - These background programs have Table Area I and the driver partition included in their logical address space. Each program starts at word 34 of the logical page following the driver partition. Otherwise these programs are treated the same as other disc resident programs.

TYPE 4 BACKGROUND DISC RESIDENT PROGRAMS WITH COMMON - These programs are treated the same as the disc resident programs without COMMON. The only difference is that the program starts at word 34 of the logical page following the COMMON area.

Appendix C
RTE-IV System Disc Layout

DISC LAYOUT OF AN RTE-IV SYSTEM

FIGURE C-1 DIAGRAMS THE ALLOCATION OF DISC SPACE BY RT4GN WHEN IT CREATES AN RTE-IV SYSTEM.

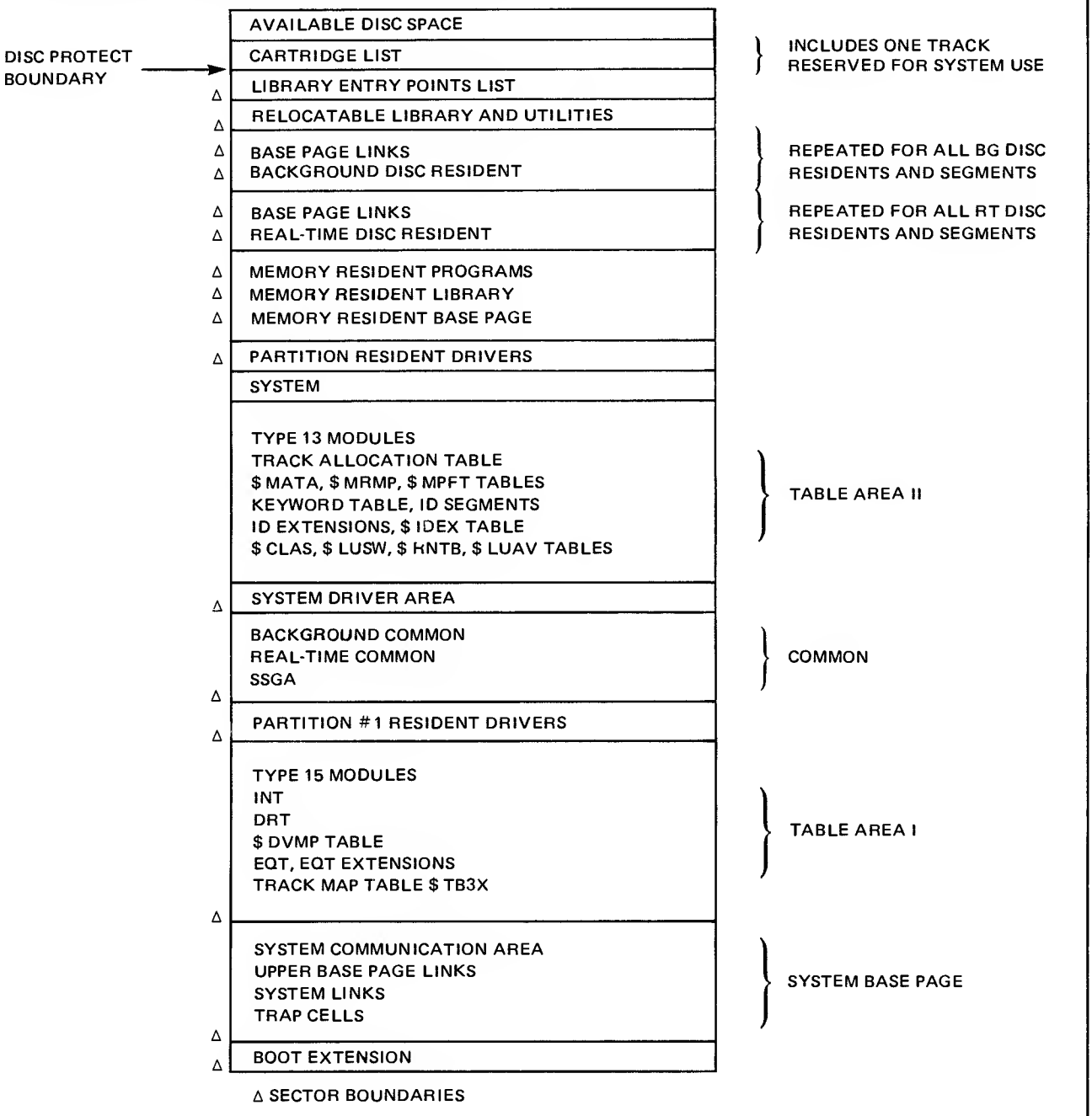


Figure C-1. RTE-IV SYSTEM DISC LAYOUT

Appendix D
Generation Worksheet Forms

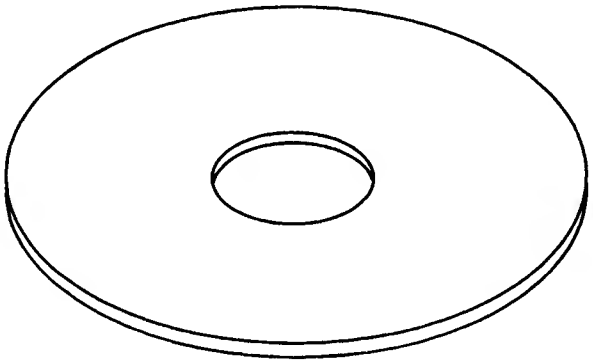
The following pages contain the blank generation worksheet forms. In the lower right corner of these blank worksheets you will find the figure number of the corresponding sample worksheets that are located throughout the manual.

It is recommended that all of the worksheets that are included (in their appropriate order) in this appendix be duplicated. The copies then can be used for planning the system, and the blank original worksheets can be left in the manual for future use.

HP 7900 DISC WORKSHEET

SUBCHANNEL 1

REMOVABLE

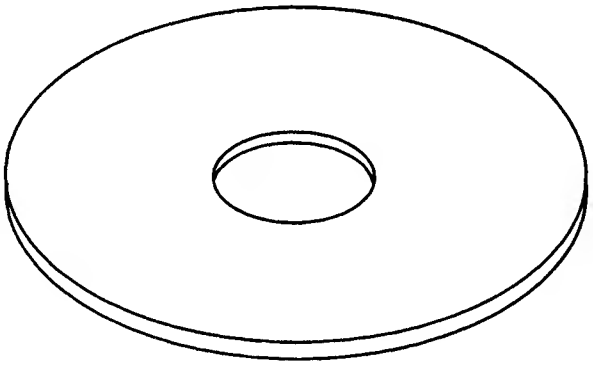


NO. OF TRACKS AVAILABLE _____

FIRST TRACK _____

SUBCHANNEL 0

FIXED



NO. OF TRACKS AVAILABLE _____

FIRST TRACK _____

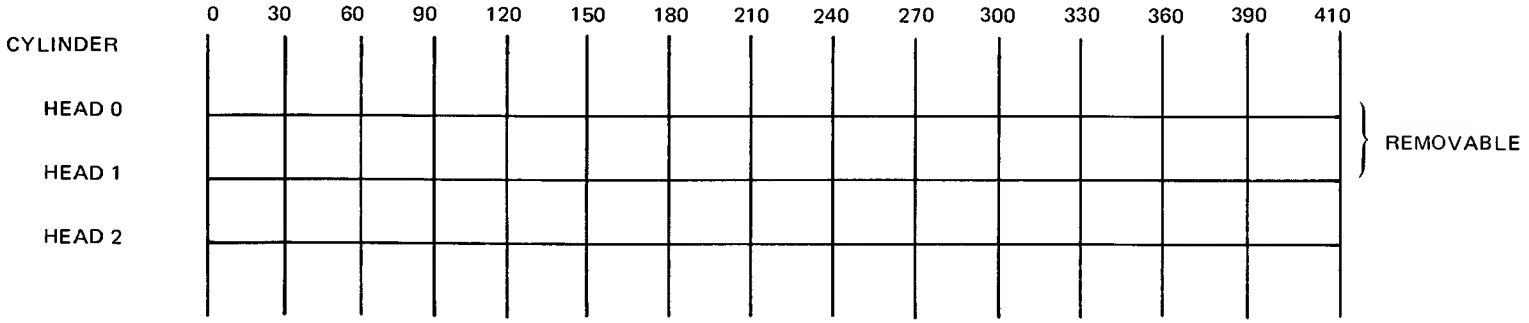
SYSTEM SUBCHANNEL NUMBER _____ (LOGICAL UNIT 2)

AUXILIARY SUBCHANNEL NUMBER _____ (LOGICAL UNIT 3)

HP 7905 DISC WORKSHEET

STEP 1 FILL IN UNIT NUMBER: _____

STEP 2 TRACKS ARE SHOWN END-TO-END ON THREE SURFACES. USE PENCIL TO CIRCLE YOUR SUB-CHANNELS. WITHIN EACH CIRCLE WRITE THE FOLLOWING INFORMATION: THE SUBCHANNEL NUMBER; THE NUMBERS OF THE STARTING AND ENDING CYLINDERS; THE TOTAL NUMBER OF TRACKS, EXCLUDING SPARES; THE NUMBER OF SPARE TRACKS; AND THE LOGICAL UNIT NUMBER FOR EACH SUBCHANNEL.



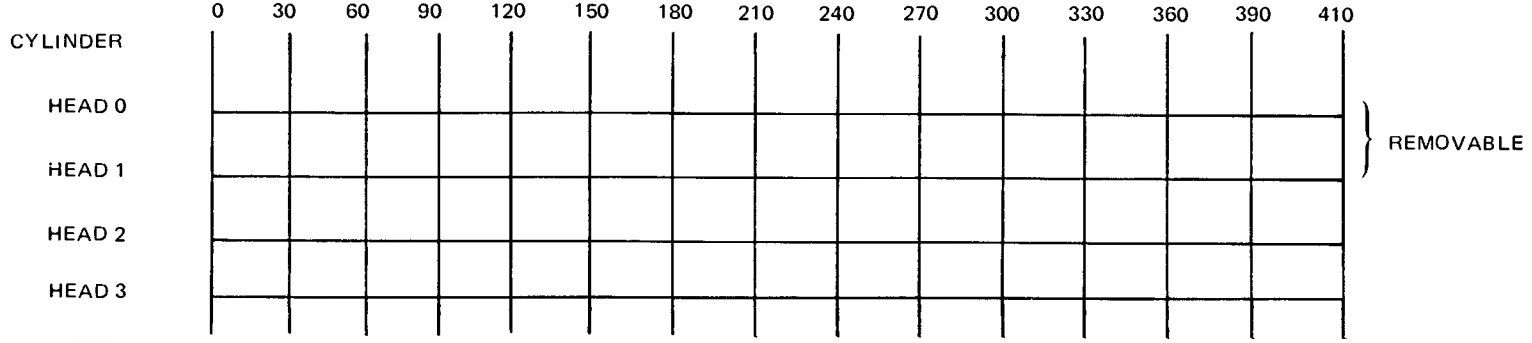
STEP 3 TRANSLATE STEP 2 TO NUMBERS:

SUBCHANNEL	# OF TRACKS, EXCLUDING SPARES	STARTING CYLINDER	STARTING HEAD	TOTAL # OF SURFACES INCLUDED IN SUBCHANNEL	NUMBER OF SPARES	SYSTEM? (√)	AUXILIARY? (√)

HP 7906(H) DISC WORKSHEET

STEP 1 FILL IN UNIT/ADDRESS NUMBER: _____

STEP 2 TRACKS ARE SHOWN END-TO-END ON FOUR SURFACES. USE PENCIL TO CIRCLE YOUR SUB-CHANNELS. WITHIN EACH CIRCLE WRITE THE FOLLOWING INFORMATION: THE SUBCHANNEL NUMBER; THE NUMBERS OF THE STARTING AND ENDING CYLINDERS; THE TOTAL NUMBER OF TRACKS, EXCLUDING SPARES; THE NUMBER OF SPARE TRACKS; AND THE LOGICAL UNIT NUMBER FOR EACH SUBCHANNEL.



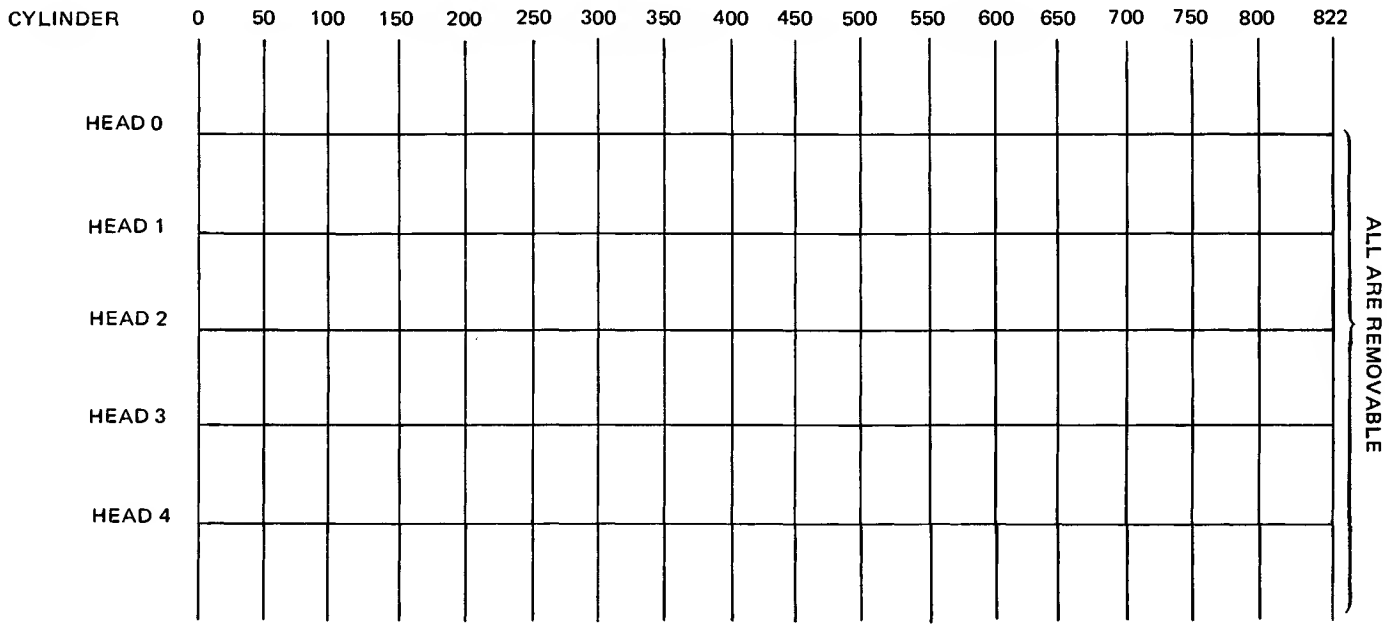
STEP 3 TRANSLATE STEP 2 TO NUMBERS:

SUBCHANNEL	# OF TRACKS, EXCLUDING SPARES	STARTING CYLINDER	STARTING HEAD	TOTAL # OF SURFACES INCLUDED IN SUBCHANNEL	NUMBER OF SPARES	SYSTEM? (√)	AUXILIARY? (√)

HP 7920(H) DISC WORKSHEET

STEP 1 FILL IN UNIT/ADDRESS NUMBER: _____

STEP 2 TRACKS ARE SHOWN END-TO-END ON FIVE SURFACES. USE PENCIL TO CIRCLE YOUR SUB-CHANNELS. WITHIN EACH CIRCLE WRITE THE FOLLOWING INFORMATION: THE SUBCHANNEL NUMBER; THE NUMBERS OF THE STARTING AND ENDING CYLINDERS; THE TOTAL NUMBER OF TRACKS, EXCLUDING SPARES; THE NUMBER OF SPARE TRACKS; THE LOGICAL UNIT NUMBER FOR EACH SUBCHANNEL.



HP 7920 DISC WORKSHEET (Cont.)

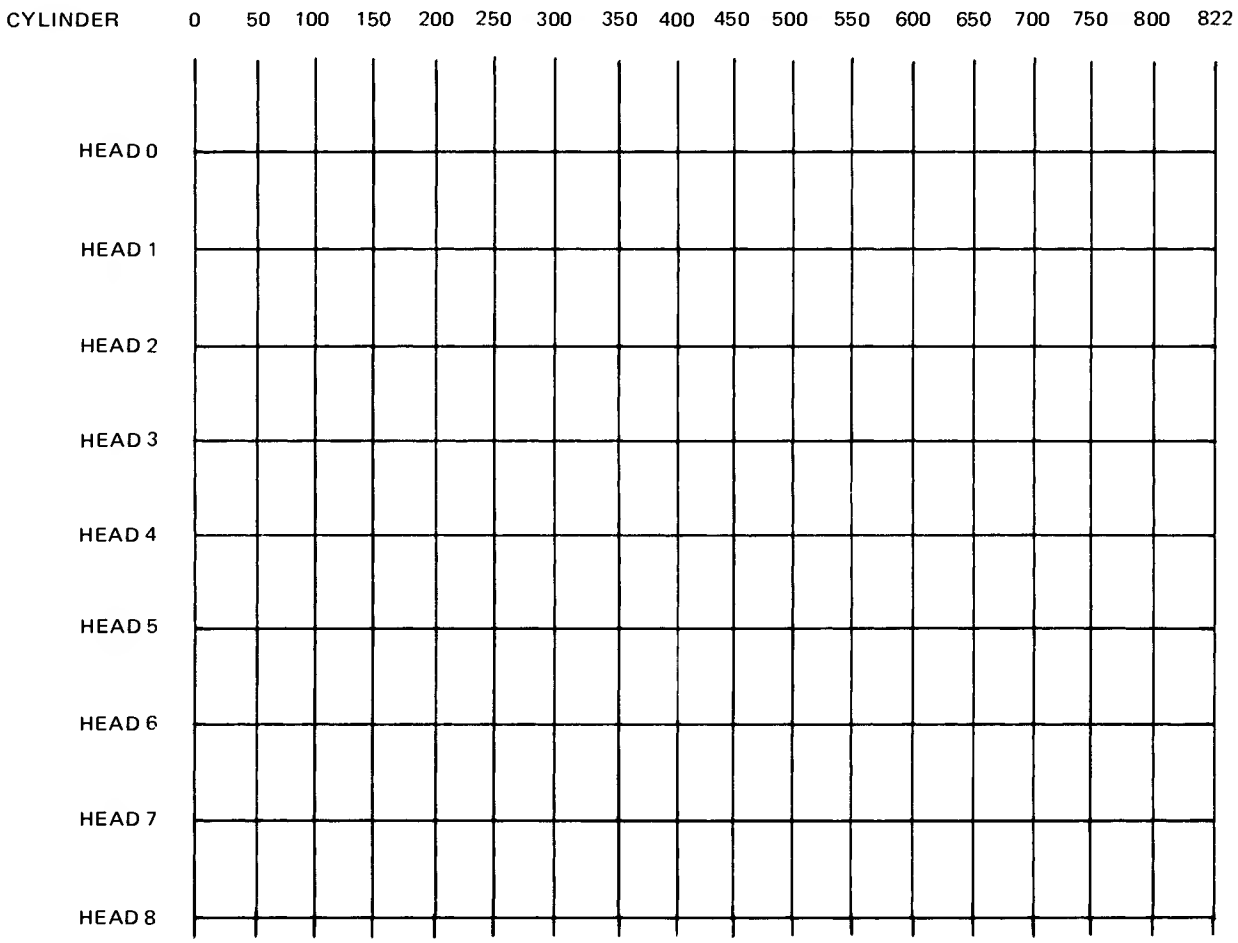
STEP 3 TRANSLATE STEP 2 TO NUMBERS:

SUBCHANNEL	# OF TRACKS, EXCLUDING SPARES	STARTING CYLINDER	STARTING HEAD	TOTAL # OF SURFACES INCLUDED IN SUBCHANNEL	NUMBER OF SPARES	SYSTEM? (√)	AUXILIARY? (√)

HP 7925(H) DISC WORKSHEET

STEP 1 FILL IN UNIT/ADDRESS NUMBER: _____

STEP 2 TRACKS ARE SHOWN END-TO-END ON NINE SURFACES. USE PENCIL TO CIRCLE YOUR SUB-CHANNELS. WITHIN EACH CIRCLE WRITE THE FOLLOWING INFORMATION: THE SUB-CHANNEL NUMBER; THE NUMBERS OF THE STARTING AND ENDING CYLINDERS; THE TOTAL NUMBER OF TRACKS, EXCLUDING SPARES; THE NUMBER OF SPARE TRACKS; THE LOGICAL UNIT NUMBER FOR EACH SUBCHANNEL.



HP 7925 DISC WORKSHEET (Cont.)

STEP 3 TRANSLATE STEP 2 TO NUMBERS:

SUBCHANNEL	# OF TRACKS, EXCLUDING SPARES	STARTING CYLINDER	STARTING HEAD	TOTAL # OF SURFACES INCLUDED IN SUBCHANNEL	NUMBER OF SPARES	SYSTEM? ( )	AUXILIARY? ( )
0							
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							

HP 7925 DISC WORKSHEET (Cont.)

STEP 3 TRANSLATE STEP 2 TO NUMBERS:

SUBCHANNEL	# OF TRACKS, EXCLUDING SPARES	STARTING CYLINDER	STARTING HEAD	TOTAL # OF SURFACES INCLUDED IN SUBCHANNEL	NUMBER OF SPARES	SYSTEM? ( )	AUXILIARY? ( )
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							

HP 9895 DISC WORKSHEET

STEP 1 FILL IN ICD ADDRESS NUMBER: _____

STEP 2 ONLY ONE SUBCHANNEL PER DRIVE WILL BE DEFINED. THE FOLLOWING DEFINITION IS THE HP STANDARD DEFINITION FOR 9895 FLEXIBLE DISC

SUBCHANNEL	# OF TRACKS, EXCLUDING SPARES	STARTING CYLINDER	STARTING HEAD	TOTAL # OF SURFACES INCLUDED IN SUBCHANNEL	NUMBER OF SPARES	UNIT #
DOUBLE-SIDED OPERATION						
1	134	0	0	2	20	0
2	134	0	0	2	20	1
SINGLE-SIDED OPERATION						
1	67	0	0	1	10	0
2	67	0	0	1	10	1

RTE-IV I/O CONFIGURATION WORKSHEET

PAGE _____ OF _____

SELECT CODE (OCTAL)	DEVICE NAME	DRIVER NAME (DVyxx)	LU NO. (DEC.)	EQT/SUBCH. NO. (DEC.)	INTERRUPT TABLE ENTRY	BUF. REQ. (B)	DCPC (D)	TIME-OUT (DEC. NO. OF 10 MS.)	EQT EXT. (DEC. NO. WORDS)	SYSTEM DRIVER AREA (S)	SYSTEM DRIVER AREA WITH MAPPING (M)

INITIALIZATION PHASE WORKSHEET

Initialization Phase

(1) **LIST FILE NAMR?**

_____ (generator listed output)

(2) **ECHO?**

_____ (YES or NO; YES echoes all listed output to user console)

(3) **OUTPUT FILE NAMR?**

_____ (contains generated system, must specify file size in blocks)

(4) **SYSTEM DISC MODEL?**

_____ (disc model # in destination system)

(5a) **HP 7900 Disc Only**

CONTROLLER SELECT CODE?

_____ (lower # oct. select code for sys. disc controller)

 # TRKS, FIRST TRK ON SUBCHNL? (even subchannels - fixed platter, odd subchannels - removable platter; enter dec. values)

0?

_____ , _____

1?

_____ , _____ (terminate your final entry with a /E)

2?

_____ , _____

3?

_____ , _____

4?

_____ , _____

5?

_____ , _____

6?

_____ , _____

7?

_____ , _____

(5b) HP 7905/7906/7920/7925 Discs

CONTROLLER SELECT CODE?

_____ (oct. select code for sys. disc controller)

MODEL, # TRKS, FIRST CYL #, HEAD, #SURFACES, UNIT, #SPARES FOR SUBCHNL:

00? _____,_____,_____,_____,_____,_____,_____ (enter dec.values)

01? _____,_____,_____,_____,_____,_____,_____ (terminate your final entry with a /E if <32 subchannels defined)

02? _____,_____,_____,_____,_____,_____,_____

03? _____,_____,_____,_____,_____,_____,_____

04? _____,_____,_____,_____,_____,_____,_____

05? _____,_____,_____,_____,_____,_____,_____

06? _____,_____,_____,_____,_____,_____,_____

07? _____,_____,_____,_____,_____,_____,_____

08? _____,_____,_____,_____,_____,_____,_____

09? _____,_____,_____,_____,_____,_____,_____

10? _____,_____,_____,_____,_____,_____,_____

11? _____,_____,_____,_____,_____,_____,_____

12? _____,_____,_____,_____,_____,_____,_____

13? _____,_____,_____,_____,_____,_____,_____

14? _____,_____,_____,_____,_____,_____,_____

15? _____,_____,_____,_____,_____,_____,_____

16? _____,_____,_____,_____,_____,_____,_____

(5b) HP 7905/7906/7920/7925 Discs (Continued)

17?

_____, _____, _____, _____, _____, _____, _____

18?

_____, _____, _____, _____, _____, _____, _____

19?

_____, _____, _____, _____, _____, _____, _____

20?

_____, _____, _____, _____, _____, _____, _____

21?

_____, _____, _____, _____, _____, _____, _____

22?

_____, _____, _____, _____, _____, _____, _____

23?

_____, _____, _____, _____, _____, _____, _____

24?

_____, _____, _____, _____, _____, _____, _____

25?

_____, _____, _____, _____, _____, _____, _____

26?

_____, _____, _____, _____, _____, _____, _____

27?

_____, _____, _____, _____, _____, _____, _____

28?

_____, _____, _____, _____, _____, _____, _____

29?

_____, _____, _____, _____, _____, _____, _____

30?

_____, _____, _____, _____, _____, _____, _____

31?

_____, _____, _____, _____, _____, _____, _____

(5c) HP 7906H/7920H/7925H/9895 Discs

CONTROLLER SELECT CODE?

_____

(oct. select code for sys. disc controller)

MODEL, # TRKS, FIRST CYL #, HEAD, # SURFACES, ADDRESS, # SPARES (, UNIT) FOR SUBCHNL:

00? _____,_____,_____,_____,_____,_____,_____,_____

(enter dec.values)

01? _____,_____,_____,_____,_____,_____,_____,_____

(terminate your final entry with a /E if <32 subchannels defined)

02? _____,_____,_____,_____,_____,_____,_____,_____

03? _____,_____,_____,_____,_____,_____,_____,_____

04? _____,_____,_____,_____,_____,_____,_____,_____

05? _____,_____,_____,_____,_____,_____,_____,_____

06? _____,_____,_____,_____,_____,_____,_____,_____

07? _____,_____,_____,_____,_____,_____,_____,_____

08? _____,_____,_____,_____,_____,_____,_____,_____

09? _____,_____,_____,_____,_____,_____,_____,_____

10? _____,_____,_____,_____,_____,_____,_____,_____

11? _____,_____,_____,_____,_____,_____,_____,_____

12? _____,_____,_____,_____,_____,_____,_____,_____

13? _____,_____,_____,_____,_____,_____,_____,_____

14? _____,_____,_____,_____,_____,_____,_____,_____

15? _____,_____,_____,_____,_____,_____,_____,_____

16? _____,_____,_____,_____,_____,_____,_____,_____

Figure 2-1. Initialization Phase Worksheet Example (Cont.)

(5c) HP 7906H/7920H/7925H/9895 Discs (Continued)

17?

_____, _____, _____, _____, _____, _____, _____, _____

18?

_____, _____, _____, _____, _____, _____, _____, _____

19?

_____, _____, _____, _____, _____, _____, _____, _____

20?

_____, _____, _____, _____, _____, _____, _____, _____

21?

_____, _____, _____, _____, _____, _____, _____, _____

22?

_____, _____, _____, _____, _____, _____, _____, _____

23?

_____, _____, _____, _____, _____, _____, _____, _____

24?

_____, _____, _____, _____, _____, _____, _____, _____

25?

_____, _____, _____, _____, _____, _____, _____, _____

26?

_____, _____, _____, _____, _____, _____, _____, _____

27?

_____, _____, _____, _____, _____, _____, _____, _____

28?

_____, _____, _____, _____, _____, _____, _____, _____

29?

_____, _____, _____, _____, _____, _____, _____, _____

30?

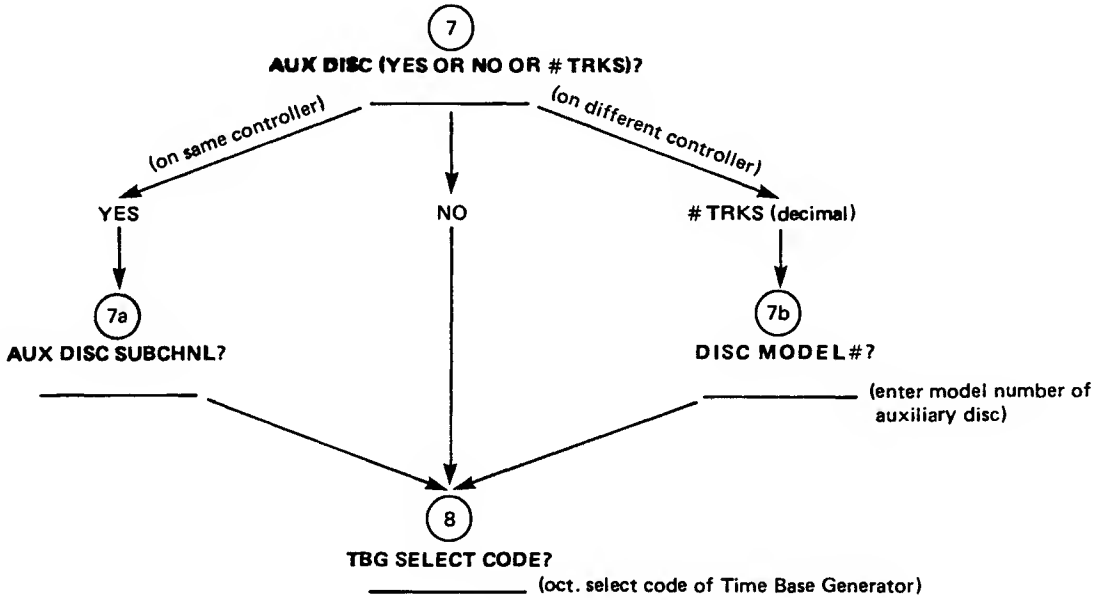
_____, _____, _____, _____, _____, _____, _____, _____

31?

_____, _____, _____, _____, _____, _____, _____, _____

(6) SYSTEM SUBCHNL?

_____



(9) PRIV. INT. SELECT CODE?

_____ (oct. select code or 0)

(10) MEM. RES. ACCESS TABLE AREA II?

_____ (YES or NO)

(11) RT MEMORY LOCK?

_____ (YES or NO)

(12) BG MEMORY LOCK?

_____ (YES or NO)

(13) SWAP DELAY?

_____ (dec. value from 0 to 255 - represents tens of milliseconds)

(14) MEM SIZE?

_____ (dec. # of memory pages ≥ 48)

(15) BOOT FILE NAMR?

_____ (file or LU # or 0)

PROGRAM INPUT PHASE WORKSHEET

PROG INPUT PHASE:

(output by generator at start of Program Input Phase)

(generator prompt issued throughout Program and Parameter Input Phases)

(16a) Enter mapping options using the MAP command. This command may be reentered at any time during this phase to change mapping options.

```
( MAP { MODULES
        GLOBALS
        LINKS      ; may have combinations, separated by commas
        OFF
        ALL        )
```

```
MAP _____ [, optional ----------]
```

(16b) Enter linkage control options using the LINKS IN command. The LINKS IN command may be reentered at any time during this phase to change linkage options.

```
(LINKS IN {BASE   )
          {CURRENT}
```

LINKS IN _____ (specify BASE or CURRENT)

(16c) Enter the RELOCATE commands (with optional MAP, LINKS IN, and DISPLAY commands)

REL — _____ _____ _____ _____ (REL [(name)] ,filename [: sc [: cartridge label]])

(RT4GN responds with a — after each user input)

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

REL —

(16c) REL _____ _____ _____ _____ _____ (REL [(name)] ,filename [: sc [: cartridge label]])

(RT4GN responds with a — after each user input)

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

REL _____ _____ _____ _____ _____

(16d) Enter DISPLAY command options to obtain symbol table information, if necessary.

```
                                    ( DISPLAY { TABLE
                                              { UNDEFS [,TR]
                                              { symbol name  )
```

DISPLAY _____ [, _____ optional] (enter either TABLE, UNDEFS, or symbol name; UNDEFS optionally followed by a TR)

(16e) Enter /E to terminate this phase.

PARAMETER INPUT PHASE WORKSHEET

Parameter Input Phase

(modify type, priority, and execution interval, or the ENT (entry) record of any of the programs specified during the Program Input Phase)

(17) PARAMETERS

(output by generator at start of Parameter Input Phase)

\-

(generator prompt)

_____ ,_____ ,_____ ,_____

(name, Type [,priority [,execution interval]])

\-

_____ ,_____ ,_____ ,_____

(terminate your final entry with a /E)

\-

_____ ,_____ ,_____ ,_____

\-

_____ ,_____ ,_____ ,_____

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_____ ,_____ ,_____ ,_____

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(18) CHANGE ENTS? (change/create entry points?)

— (generator prompt)

_______ , _______ , _______ (entry, type - AB or RP, value)

—

_______ , _______ , _______ (terminate your final entry with a /E)

—

_______ , _______ , _______

—

_______ , _______ , _______

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_______ , _______ , _______

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_______ , _______ , _______

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_______ , _______ , _______

(18) **CHANGE ENTS?** (change/create entry points?)

\- (generator prompt)

_____ , _____ , _____ (entry, type - AB or RP, value)

\- (terminate your final entry with a /E)

_____ , _____ , _____

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_____ , _____ , _____

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_____ , _____ , _____

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_____ , _____ , _____

(18) **CHANGE ENTS?** (change/create entry points?)

— (generator prompt)

_____ , _____ , _____ (entry, type - AB or RP, value)

—

_____ , _____ , _____ (terminate your final entry with a /E)

—

_____ , _____ , _____

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_____ , _____ , _____

(18) CHANGE ENTS? (change/create entry points?)

— (generator prompt)

_____ , _____ , _____ (entry, type - AB or RP, value)

—

_____ , _____ , _____ (terminate your final entry with a /E)

—

_____ , _____ , _____

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_____ , _____ , _____

—

_____ , _____ , _____

—

_____ , _____ , _____

—

_____ , _____ , _____

(18) **CHANGE ENTS?** (change/create entry points?)

— (generator prompt)

________ , ________ , ________ (entry, type - AB or RP, value)

—

________ , ________ , ________ (terminate your final entry with a /E)

—

________ , ________ , ________

—

________ , ________ , ________

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________ , ________ , ________

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________ , ________ , ________

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________ , ________ , ________

—

________ , ________ , ________

(18) **CHANGE ENTS?** (change/create entry points?)

— (generator prompt)

________ , ________ , ________ (entry, type - AB or RP, value)

—

________ , ________ , ________ (terminate your final entry with a /E)

—

________ , ________ , ________

—

________ , ________ , ________

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________ , ________ , ________

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________ , ________ , ________

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________ , ________ , ________

TABLE AREA I ≪PAGE XXXXX≫ :

(output by generator at start of Table Generation Phase)

(19) **EQUIPMENT TABLE ENTRY**

EQT 01?

_____,_____,_____,_____,_____,_____,_____,_____

(oct. select code, driver [,B] [,D] [,S] [,M] [,T = ttttt] [,X = xxx])

EQT 02?

_____,_____,_____,_____,_____,_____,_____,_____

(do not specify SDA for system disc driver)

EQT 03?

_____,_____,_____,_____,_____,_____,_____,_____

(terminate your final entry with a /E)

EQT 04?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 05?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 06?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 07?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 08?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 09?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 10?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 11?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 12?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 13?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 14?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 15?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 16?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 17?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 18?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 19?

_____,_____,_____,_____,_____,_____,_____,_____

(19) Equipment Table Entry (Continued)

EQT 20?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 21?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 22?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 23?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 24?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 25?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 26?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 27?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 28?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 29?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 30?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 31?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 32?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 33?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 34?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 35?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 36?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 37?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 38?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 39?

_____, _____, _____, _____, _____, _____, _____, _____

(19) Equipment Table Entry (Continued)

EQT 40?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 41?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 42?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 43?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 44?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 45?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 46?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 47?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 48?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 49?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 50?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 51?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 52?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 53?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 54?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 55?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 56?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 57?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 58?

_____, _____, _____, _____, _____, _____, _____, _____

EQT 59?

_____, _____, _____, _____, _____, _____, _____, _____

Figure 2-7. Table Generation Phase Worksheet Example (Continued)

(19) Equipment Table Entry (Continued)

EQT 60?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 61?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 62?

_____,_____,_____,_____,_____,_____,_____,_____

EQT 63?

_____,_____,_____,_____,_____,_____,_____,_____

(20) **DEVICE REFERENCE TABLE**

(system console) **001 = EQT # ?** (LU1 = EQT # ?)

_____ , _____ (eqt entry, optional subchannel; the subchannel # should match the response in Step (6))

(system disc) **002 = EQT # ?**

_____ , _____ (terminate your final entry with a /E)

(auxiliary disc) **003 = EQT # ?**

_____ , _____ (number should match response to Step (7a), if entered)

(standard output) **004 = EQT # ?**

_____ , _____

(standard input) **005 = EQT # ?**

_____ , _____

(standard list) **006 = EQT # ?**

_____ , _____

007 = EQT # ?

_____ , _____

(mag. tape) **008 = EQT # ?**

_____ , _____

009 = EQT # ?

_____ , _____

010 = EQT # ?

_____ , _____

011 = EQT # ?

_____ , _____

012 = EQT # ?

_____ , _____

013 = EQT # ?

_____ , _____

014 = EQT # ?

_____ , _____

015 = EQT # ?

_____ , _____

016 = EQT # ?

_____ , _____

017 = EQT # ?

_____ , _____

018 = EQT # ?

_____ , _____

019 = EQT # ?

_____ , _____

020 = EQT # ?

_____ , _____

(20) Device Reference Table (Continued)

021 = EQT # ? _____, _____	041 = EQT # ? _____, _____	061 = EQT # ? _____, _____
022 = EQT # ? _____, _____	042 = EQT # ? _____, _____	062 = EQT # ? _____, _____
023 = EQT # ? _____, _____	043 = EQT # ? _____, _____	063 = EQT # ? _____, _____
024 = EQT # ? _____, _____	044 = EQT # ? _____, _____	064 = EQT # ? _____, _____
025 = EQT # ? _____, _____	045 = EQT # ? _____, _____	065 = EQT # ? _____, _____
026 = EQT # ? _____, _____	046 = EQT # ? _____, _____	066 = EQT # ? _____, _____
027 = EQT # ? _____, _____	047 = EQT # ? _____, _____	067 = EQT # ? _____, _____
028 = EQT # ? _____, _____	048 = EQT # ? _____, _____	068 = EQT # ? _____, _____
029 = EQT # ? _____, _____	049 = EQT # ? _____, _____	069 = EQT # ? _____, _____
030 = EQT # ? _____, _____	050 = EQT # ? _____, _____	070 = EQT # ? _____, _____
031 = EQT # ? _____, _____	051 = EQT # ? _____, _____	071 = EQT # ? _____, _____
032 = EQT # ? _____, _____	052 = EQT # ? _____, _____	072 = EQT # ? _____, _____
033 = EQT # ? _____, _____	053 = EQT # ? _____, _____	073 = EQT # ? _____, _____
034 = EQT # ? _____, _____	054 = EQT # ? _____, _____	074 = EQT # ? _____, _____
035 = EQT # ? _____, _____	055 = EQT # ? _____, _____	075 = EQT # ? _____, _____
036 = EQT # ? _____, _____	056 = EQT # ? _____, _____	076 = EQT # ? _____, _____
037 = EQT # ? _____, _____	057 = EQT # ? _____, _____	077 = EQT # ? _____, _____
038 = EQT # ? _____, _____	058 = EQT # ? _____, _____	078 = EQT # ? _____, _____
039 = EQT # ? _____, _____	059 = EQT # ? _____, _____	079 = EQT # ? _____, _____
040 = EQT # ? _____, _____	060 = EQT # ? _____, _____	080 = EQT # ? _____, _____

(20) Device Reference Table (Continued)

081 = EQT # ? _____, _____	101 = EQT # ? _____, _____	121 = EQT # ? _____, _____
082 = EQT # ? _____, _____	102 = EQT # ? _____, _____	122 = EQT # ? _____, _____
083 = EQT # ? _____, _____	103 = EQT # ? _____, _____	123 = EQT # ? _____, _____
084 = EQT # ? _____, _____	104 = EQT # ? _____, _____	124 = EQT # ? _____, _____
085 = EQT # ? _____, _____	105 = EQT # ? _____, _____	125 = EQT # ? _____, _____
086 = EQT # ? _____, _____	106 = EQT # ? _____, _____	126 = EQT # ? _____, _____
087 = EQT # ? _____, _____	107 = EQT # ? _____, _____	127 = EQT # ? _____, _____
088 = EQT # ? _____, _____	108 = EQT # ? _____, _____	128 = EQT # ? _____, _____
089 = EQT # ? _____, _____	109 = EQT # ? _____, _____	129 = EQT # ? _____, _____
090 = EQT # ? _____, _____	110 = EQT # ? _____, _____	130 = EQT # ? _____, _____
091 = EQT # ? _____, _____	111 = EQT # ? _____, _____	131 = EQT # ? _____, _____
092 = EQT # ? _____, _____	112 = EQT # ? _____, _____	132 = EQT # ? _____, _____
093 = EQT # ? _____, _____	113 = EQT # ? _____, _____	133 = EQT # ? _____, _____
094 = EQT # ? _____, _____	114 = EQT # ? _____, _____	134 = EQT # ? _____, _____
095 = EQT # ? _____, _____	115 = EQT # ? _____, _____	135 = EQT # ? _____, _____
096 = EQT # ? _____, _____	116 = EQT # ? _____, _____	136 = EQT # ? _____, _____
097 = EQT # ? _____, _____	117 = EQT # ? _____, _____	137 = EQT # ? _____, _____
098 = EQT # ? _____, _____	118 = EQT # ? _____, _____	138 = EQT # ? _____, _____
099 = EQT # ? _____, _____	119 = EQT # ? _____, _____	139 = EQT # ? _____, _____
100 = EQT # ? _____, _____	120 = EQT # ? _____, _____	140 = EQT # ? _____, _____

(20) Device Reference Table (Continued)

141 = EQT # ? _____, _____	161 = EQT # ? _____, _____	181 = EQT # ? _____, _____
142 = EQT # ? _____, _____	162 = EQT # ? _____, _____	182 = EQT # ? _____, _____
143 = EQT # ? _____, _____	163 = EQT # ? _____, _____	183 = EQT # ? _____, _____
144 = EQT # ? _____, _____	164 = EQT # ? _____, _____	184 = EQT # ? _____, _____
145 = EQT # ? _____, _____	165 = EQT # ? _____, _____	185 = EQT # ? _____, _____
146 = EQT # ? _____, _____	166 = EQT # ? _____, _____	186 = EQT # ? _____, _____
147 = EQT # ? _____, _____	167 = EQT # ? _____, _____	187 = EQT # ? _____, _____
148 = EQT # ? _____, _____	168 = EQT # ? _____, _____	188 = EQT # ? _____, _____
149 = EQT # ? _____, _____	169 = EQT # ? _____, _____	189 = EQT # ? _____, _____
150 = EQT # ? _____, _____	170 = EQT # ? _____, _____	190 = EQT # ? _____, _____
151 = EQT # ? _____, _____	171 = EQT # ? _____, _____	191 = EQT # ? _____, _____
152 = EQT # ? _____, _____	172 = EQT # ? _____, _____	192 = EQT # ? _____, _____
153 = EQT # ? _____, _____	173 = EQT # ? _____, _____	193 = EQT # ? _____, _____
154 = EQT # ? _____, _____	174 = EQT # ? _____, _____	194 = EQT # ? _____, _____
155 = EQT # ? _____, _____	175 = EQT # ? _____, _____	195 = EQT # ? _____, _____
156 = EQT # ? _____, _____	176 = EQT # ? _____, _____	196 = EQT # ? _____, _____
157 = EQT # ? _____, _____	177 = EQT # ? _____, _____	197 = EQT # ? _____, _____
158 = EQT # ? _____, _____	178 = EQT # ? _____, _____	198 = EQT # ? _____, _____
159 = EQT # ? _____, _____	179 = EQT # ? _____, _____	199 = EQT # ? _____, _____
160 = EQT # ? _____, _____	180 = EQT # ? _____, _____	200 = EQT # ? _____, _____

(20) Device Reference Table (Continued)

201 = EQT # ?
_____, _____

202 = EQT # ?
_____, _____

203 = EQT # ?
_____, _____

204 = EQT # ?
_____, _____

205 = EQT # ?
_____, _____

206 = EQT # ?
_____, _____

207 = EQT # ?
_____, _____

208 = EQT # ?
_____, _____

209 = EQT # ?
_____, _____

210 = EQT # ?
_____, _____

211 = EQT # ?
_____, _____

212 = EQT # ?
_____, _____

213 = EQT # ?
_____, _____

214 = EQT # ?
_____, _____

215 = EQT # ?
_____, _____

216 = EQT # ?
_____, _____

217 = EQT # ?
_____, _____

218 = EQT # ?
_____, _____

219 = EQT # ?
_____, _____

220 = EQT # ?
_____, _____

221 = EQT # ?
_____, _____

222 = EQT # ?
_____, _____

223 = EQT # ?
_____, _____

224 = EQT # ?
_____, _____

225 = EQT # ?
_____, _____

226 = EQT # ?
_____, _____

227 = EQT # ?
_____, _____

228 = EQT # ?
_____, _____

229 = EQT # ?
_____, _____

230 = EQT # ?
_____, _____

231 = EQT # ?
_____, _____

232 = EQT # ?
_____, _____

233 = EQT # ?
_____, _____

234 = EQT # ?
_____, _____

235 = EQT # ?
_____, _____

236 = EQT # ?
_____, _____

237 = EQT # ?
_____, _____

238 = EQT # ?
_____, _____

239 = EQT # ?
_____, _____

240 = EQT # ?
_____, _____

241 = EQT # ?
_____, _____

242 = EQT # ?
_____, _____

243 = EQT # ?
_____, _____

244 = EQT # ?
_____, _____

245 = EQT # ?
_____, _____

246 = EQT # ?
_____, _____

247 = EQT # ?
_____, _____

248 = EQT # ?
_____, _____

249 = EQT # ?
_____, _____

250 = EQT # ?
_____, _____

251 = EQT # ?
_____, _____

252 = EQT # ?
_____, _____

253 = EQT # ?
_____, _____

254 = EQT # ?
_____, _____

(21) **INTERRUPT TABLE**

(enter octal select codes in ascending order)

—

(generator prompt)

_____, _____, _____

(select code, option, destination)

—

_____, _____, _____

(terminate your final entry with a /E)

—

_____, _____, _____

—

_____, _____, _____

—

_____, _____, _____

—

_____, _____, _____

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_____, _____, _____

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_____, _____, _____

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_____, _____, _____

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_____, _____, _____

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_____, _____, _____

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_____, _____, _____

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_____, _____, _____

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_____, _____, _____

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_____, _____, _____

—

_____, _____, _____

—

_____, _____, _____

SYSTEM BOUNDARIES PHASE WORKSHEET

(22)	DRIVR PART 00002	(dec. # of pages)
	CHANGE DRIVR PART?	(increase driver partition size?)
	_____	(enter dec. # of pages > reported value and < 17, otherwise 0)
	DP 01 ≪PAGE XXXXX≫ :	
	DVY3 x map here	(load map for system disc driver plus any other drivers that will fit in this driver partition)
(23)	RT COMMON xxxxx	(dec. # of words)
	CHANGE RT COMMON?	(change real-time COMMON?)
	_____	(enter dec. # of WORDS > reported value, otherwise 0)
	RT COMMON ADD xxxxx	(octal address)
(24)	BG COMMON xxxxx	(reported in dec. words)
	CHANGE BG COMMON?	(change background COMMON?)
	_____	(enter dec. # of PAGE increments - 1024 words each, otherwise 0)
	BG COMMON ADD xxxxx	(octal address)
	BG COMMON xxxxx	

Figure 2-8. System Boundaries Phase Worksheet Example

SYSTEM AND PROGRAM LOADING PHASE WORKSHEET

TABLE AREA II ≪PAGE XXXXX≫ :

(25) # OF I/O CLASSES?
_____ (dec. # from 1 to 255; typical entry would be 10)

(26) # OF LU MAPPINGS?
_____ (dec. # from 1 to 255; typical entry would be 10)

(27) # OF RESOURCE NUMBERS?
_____ (dec. # from 1 to 255)

(28) BUFFER LIMITS (LOW, HIGH)?
_____ , _____ (in words, suggested entry would be 100, 400)

(29) XXXX LONG ID SEGMENTS USED (# USED)
OF BLANK LONG ID SEGMENTS? ("long" ID segments)
_____ (total # should be from 1 to 254)

(30) XXXX SHORT ID SEGMENTS USED (# USED)
OF BLANK SHORT ID SEGMENTS?
_____ (total # should be from 1 to 256)

(31) XXXX ID EXTENSIONS USED (#USED)
OF BLANK ID EXTENSIONS?
_____ (total # should be from 1 to 254)

(32) MAXIMUM # OF PARTITIONS?
_____ (dec. # ≤ 64)

Figure 2-9. System and Program Loading Phase Worksheet Example

PARTITION DEFINITION PHASE WORKSHEET

Partition Definition Phase

RT PARTITION REQMTS: (generator lists page requirements)

.
.
.

BG PARTITION REQMTS:

.
.
.

MAXIMUM PROGRAM SIZE:

W/O COM xx PAGES

W/ COM xx PAGES

W/ TA2 xx PAGES

SYS AV MEM: xxxxx WORDS (reported in decimal words)

(33) **ENTER 1ST PART PAGE: XXXXX (DEFAULT) TO YYYYY:**

_____ (enter dec. pages # value between XXXXX and YYYYY, otherwise 0 - for default value XXXXX)

SYS AV MEM: xxxxx WORDS (new size of SAM reported, decimal words)

PAGES REMAINING: xxxxx (pages remaining for partitioning)

(34) **DEFINE PARTITIONS:** (see manual about subpartitions)

PART 01, XXXX PAGES? (prompts to maximum of 64, displaying # pages remaining, may ask for SUBPARTITIONS)

_____ , _____ , _____ (decimal page size, type ,[R]

PART 02, XXXX PAGES?

_____ , _____ , _____

PART 03, XXXX,(YYYY) PAGES (subpartition mode - the number in parenthesis indicates the number of pages remaining in the mother partition)

_____ , _____ , _____

PART 04, XXXX PAGES?

_____ , _____ , _____

PART 05, XXXX PAGES?

_____ , _____ , _____

PART 06, XXXX PAGES?

_____ , _____ , _____

PART 07, XXXX PAGES?

_____ , _____ , _____ (terminate your final entry with a /E)

(34) _____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

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(34) _____ , _____ , _____

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(34) _____ , _____ , _____

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_____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

_____ , _____ , _____

(35) **MODIFY PROGRAM PAGE REQUIREMENTS?**

\-
_____ , _____ (generator prompt)

_____ , _____ (program name, decimal # of pages)

\-
_____ , _____ (terminate your final entry with a /E)

\-
_____ , _____

\-
_____ , _____

\-
_____ , _____

\-
_____ , _____

\-
_____ , _____

(36) **ASSIGN PROGRAM PARTITIONS?**

\-
_____ , _____ (generator prompt)

_____ , _____ (program name, partition #)

\-
_____ , _____ (terminate your final entry with a /E)

\-
_____ , _____

\-
_____ , _____

\-
_____ , _____

\-
_____ , _____

\-
_____ , _____

SYSTEM STORED IN FILE

SYS SIZE: ttt TRKS, sss SECS (XX SECTORS/TRACK)

= XXXXXX BLOCKS (128 WORDS/BLOCK)

RT4GN FINISHED

xxxx ERRORS

Appendix E
Sample Answer File

This sample Answer File reflects
Software Revision 2001
(January 1980).

```
"ONGE  T=00003 IS ON CR AJ   USING 00024 BLKS R=0000

0001  ****SYSTEM GENERATION ANSWER FILE*****
0002  *******
0003  *****SESSION MONITOR*****
0004  *
0005  ******INITIALIZATION PHASE******
0006  *
0007  SYSLI:OB:JA::500          * LIST FILE
0008  YES                       * ECHO ON
0009  SESSY:OB:JA::4500         * OUTPUT FILE
0010  7925                      * 7925 SYSTEM DISC
0011  12                        * CONTROLLER SELECT CODE
0012  * DISC  #TRKS  1ST-CYL  HEAD  #SURFACES  UNIT  #SPARES
0013  7925,  256,     0,      0,       9,       0,      5    *SUBCHANNEL 0
0014  7925, 1500,    29,      0,       9,       0,     66    *SUBCHANNEL 1
0015  7925,  193,   203,      0,       9,       0,      5    *SUBCHANNEL 2
0016  7925,  193,   225,      0,       9,       0,      5    *SUBCHANNEL 3
0017  7925,  193,   247,      0,       9,       0,      5    *SUBCHANNEL 4
0018  7925,  193,   269,      0,       9,       0,      5    *SUBCHANNEL 5
0019  7925,  193,   291,      0,       9,       0,      5    *SUBCHANNEL 6
0020  7925,  193,   313,      0,       9,       0,      5    *SUBCHANNEL 7
0021  7925,  193,   335,      0,       9,       0,      5    *SUBCHANNEL 8
0022  7925,  193,   357,      0,       9,       0,      5    *SUBCHANNEL 9
0023  7925,  193,   379,      0,       9,       0,      5    *SUBCHANNEL 10
0024  7925,  193,   401,      0,       9,       0,      5    *SUBCHANNEL 11
0025  7925,  256,   423,      0,       9,       0,      5    *SUBCHANNEL 12
0026  7925,  193,   452,      0,       9,       0,      5    *SUBCHANNEL 13
0027  7925,  193,   474,      0,       9,       0,      5    *SUBCHANNEL 14
0028  7925,  193,   496,      0,       9,       0,      5    *SUBCHANNEL 15
0029  7925,  193,   518,      0,       9,       0,      5    *SUBCHANNEL 16
0030  7925,  193,   540,      0,       9,       0,      5    *SUBCHANNEL 17
0031  7925,  193,   562,      0,       9,       0,      5    *SUBCHANNEL 18
0032  7925,  193,   584,      0,       9,       0,      5    *SUBCHANNEL 19
0033  7925,  193,   606,      0,       9,       0,      5    *SUBCHANNEL 20
0034  7925,  193,   628,      0,       9,       0,      5    *SUBCHANNEL 21
0035  7925,  193,   650,      0,       9,       0,      5    *SUBCHANNEL 22
0036  7925,  193,   672,      0,       9,       0,      5    *SUBCHANNEL 23
0037  7925,   96,   694,      0,       9,       0,      3    *SUBCHANNEL 24
0038  7925,  150,   705,      0,       9,       0,      3    *SUBCHANNEL 25
0039  7925,   96,   722,      0,       9,       0,      3    *SUBCHANNEL 26
0040  7925,   96,   733,      0,       9,       0,      3    *SUBCHANNEL 27
0041  7925,  194,   744,      0,       9,       0,      4    *SUBCHANNEL 28
0042  7925,  194,   766,      0,       9,       0,      4    *SUBCHANNEL 29
0043  7925,  194,   788,      0,       9,       0,      4    *SUBCHANNEL 30
0044  7925,  114,   810,      0,       9,       0,      3    *SUBCHANNEL 31
0045  0                         * SYSTEM SUBCHANNEL
0046  YES                       * AUXILIARY DISC
0047  12                        * AUXILIARY DISC SUBCHANNEL
0048  10                        * TBG SELECT CODE
0049  0                         * NO PRIVILEGED INT. CARD
0050  YES                       * MEM. RES. ACCESS TABLE AREA II
0051  YES                       * RT MEMORY LOCK
0052  YES                       * BG MEMORY LOCK
0053  50                        * SWAP DELAY
0054  512                       * MEMORY SIZE
0055  0                         * BOOT FILE NAME
0056  *
0057  *
0058  ************PROGRAM INPUT PHASE**********************
```

```
0059  *
0060  *
0061  MAP ALL                         *MAP MODULES,GLOBALS,LINKS
0062  LINKS IN CURRENT
0063  REL,%CR4S1::SM                  * RTE-IVB  OP SYS
0064  REL,%CR4S2::SM                  * RTE-IVB  OP SYS
0065  REL,%%CNFX::SM                  * CONFIGURATOR EXTENSION
0066  REL,%WHZAT::SM                  * WHZAT  (REV. CODE 2001 OR GREATER)
0067  REL,%4AUTR::SM                  * AUTO RESTART
0068  *
0069  ********DRIVERS***************
0070  *
0071  REL,%DVR32::SM                  * 7905/06/20/25 DISC DRIVER
0072  REL,%DVA32::SM                  * 7906H/7920H/7925H DISC DRIVER
0073  REL,%%TA32::SM                  * DVA32 TRACK MAP TABLE
0074  REL,%DVR23::SM                  * 7970 MAG TAPE DRIVER
0075  REL,%DVA05::SM                  * 264X TERMINAL DRIVER
0076  REL,%4DP43::SM                  * RTE-IVB POWER FAIL
0077  REL,%2DV37::SM                  * HPIB DRIVER
0078  REL,%SRQ,P::SM                  * FOR HPIB
0079  REL,%DVA12::SM                  * FOR 2631 LINE PRINTER
0080  *
0081  *********LIBRARIES**************
0082  *
0083  MAP OFF,MODULES
0084  REL,%CLIB::SM                   * COMPILER LIBRARY
0085  REL,%FF4,N::SM                  * FORTRAN-IV LIBRARY
0086  REL,%RLI81::SM                  * DOS-RTE RELOC. LIBRARY
0087  REL,%RLI82::SM                  * DOS-RTE RELOC. LIBRARY
0088  REL,%RLI83::SM                  * DOS-RTE RELOC. LIBRARY
0089  REL,%4SYLB::SM                  * SYSTEM LIBRARY
0090  REL,$LDRLB::SM                  * LOADER LIBRARY
0091  REL,%DBUGR::SM                  * USER DEBUG LIBRARY
0092  REL,$DSCLB::SM                  * ICD/MAC UTILITY LIBRARY
0093  REL,$DKULB::SM                  * ICD/MAC DISC BACKUP LIBRARY
0094  REL,%DECAR::SM                  * DECIMAL STRING ARITHMETIC LIB
0095  REL,%IB4A::SM                   * HPIB LIBRARY
0096  REL,%UTLIB::SM                  * UTIL.LIB.FOR COMPL,CLOAD,READT,WRITT
0097  REL,%BAMLB::SM                  * BASIC CORE RESIDENT LIBRARY
0098  REL,%BASLB::SM                  * BASIC SUBROUTINE LIBRARY
0099  REL,%VLIB::SM                   * VIS LIBRARY
0100  *
0101  **********************************
0102  *
0103  REL,%BMPG1::SM                  * FILE MANAGER - PART 1
0104  REL,%BMPG2::SM                  * FILE MANAGER - PART 2
0105  REL,%BMPG3::SM                  * FILE MANAGER - PART 3
0106  **************
0107  REL,%SMON1::SM                  * SESSION MONITOR #1
0108  REL,%SMON2::SM                  * SESSION MONITOR #2
0109  REL,%SP01B::SM                  * SPOOLING
0110  REL,%SP02B::SM                  * SPOOLING
0111  *
0112  ***************
0113  *
0114  REL,%4LDR::SM                   * LOADR
0115  REL,%EDITR::SM                  * EDITOR
0116  *
0117  **********************************
0118  *
```

```
0119  REL,%LGTAT::SM                * LGTAT UTILITY
0120  *
0121  **********PROGRAMS***************
0122  *
0123  REL,%LSAVE::SM                * LU SAVE PROGRAM
0124  REL,%USAVE::SM                * UNIT SAVE PROGRAM
0125  REL,%RESTR::SM                * RESTORE PROGRAM
0126  REL,%LCOPY::SM                * COPY PROGRAM
0127  REL,%COMPL::SM                * COMPL PROGRAM
0128  REL,%CLOAD::SM                * CLOAD PROGRAM
0129  REL,%READT::SM                * READT UTILITY
0130  REL,%WRITT::SM                * WRITT UTILITY
0131  REL,%HELP::SM                 * HELP UTILITY
0132  REL,%ACCTS::SM                * ACCOUNTS PROGRAM
0133  DISPLAY UNDEFS,TR
0134  /E
0135  *
0136  ****************PARAMETER INPUT PHASE***************
0137  *
0138  D.RTR,1,1
0139  WHZAT,1,41
0140  /E
0141  *
0142  **************CHANGE ENTS?**************
0143  *
0144  *
0145  ****SCIENTIFIC INSTRUCTION SET******
0146  *
0147  TAN,RP,105320
0148  SQRT,RP,105321
0149  ALOG,RP,105322
0150  ATAN,RP,105323
0151  COS,RP,105324
0152  SIN,RP,105325
0153  EXP,RP,105326
0154  ALOGT,RP,105327
0155  TANH,RP,105330
0156  DPOLY,RP,105331
0157  /CMRT,RP,105332
0158  /ATLG,RP,105333
0159  .FPWR,RP,105334
0160  .TPWR,RP,105335
0161  *
0162  *
0163  ****DOUBLE INTEGER*******
0164  *
0165  *
0166  .DAD,RP,105014
0167  .DSB,RP,105034
0168  .DMP,RP,105054
0169  .DDI,RP,105074
0170  .DSBR,RP,105114
0171  .DDIR,RP,105134
0172  .DNG,RP,105203
0173  .DIN,RP,105210
0174  .DDE,RP,105211
0175  .DIS,RP,105212
0176  .DDS,RP,105213
0177  .DCO,RP,105204
0178  *
```

```
0179  *
0180  ****FAST FORTRAN*****
0181  *
0182  *
0183  DBLE,RP,105201
0184  SNGL,RP,105202
0185  .DFER,RP,105205
0186  .XPAK,RP,105206
0187  .BLE,RP,105207
0188  .NGL,RP,105214
0189  .XCOM,RP,105215
0190  ..DCM,RP,105216
0191  DDINT,RP,105217
0192  .XFER,RP,105220
0193  .GOTO,RP,105221
0194  ..MAP,RP,105222
0195  .ENTR,RP,105223
0196  .ENTP,RP,105224
0197  .PWR2,RP,105225
0198  .FLUN,RP,105226
0199  $SETP,RP,105227
0200  .PACK,RP,105230
0201  .CFER,RP,105231
0202  ..FCM,RP,105232
0203  ..TCM,RP,105233
0204  .LBT,RP,105763
0205  .SBT,RP,105764
0206  .DLD,RP,104200
0207  .DST,RP,104400
0208  .MPY,RP,100200
0209  .DIV,RP,100400
0210  CLRIO,RP,2001
0211  *
0212  *
0213  ****HFPP - TWO WORD****
0214  *
0215  *
0216  .FAD,RP,105000
0217  .FSB,RP,105020
0218  .FMP,RP,105040
0219  .FDV,RP,105060
0220  IFIX,RP,105100
0221  .FIXD,RP,105104
0222  FLOAT,RP,105120
0223  .FLTD,RP,105124
0224  *
0225  *
0226  ****HFPP - THREE WORD*****
0227  *
0228  *
0229  .XADD,RP,105001
0230  .XSUB,RP,105021
0231  .XMPY,RP,105041
0232  .XDIV,RP,105061
0233  .XFXS,RP,105101
0234  .DINT,RP,105101
0235  .XFXD,RP,105105
0236  .XFTS,RP,105121
0237  .IDBL,RP,105121
0238  .XFTD,RP,105125
```

```
0239   *
0240   *
0241   ****HFPP - FOUR WORD*****
0242   *
0243   *
0244   .TADD,RP,105002
0245   .TSUB,RP,105022
0246   .TMPY,RP,105042
0247   .TDIV,RP,105062
0248   .TFXS,RP,105102
0249   .TINT,RP,105102
0250   .TFXD,RP,105106
0251   .TFTS,RP,105122
0252   .ITBL,RP,105122
0253   .TFTD,RP,105126
0254   *
0255   *
0256   ****EMA*****
0257   *
0258   *
0259   .EMAP,RP,105257
0260   .EMIO,RP,105240
0261   MMAP,RP,105241
0262   *
0263   *
0264   ****
0265   *
0266   *
0267   .MVW,RP,105777
0268   .CMW,RP,105776
0269   *
0270   *
0271   * FOUR WORD DOUBLE PRECISION
0272   *
0273   *
0274   Z$DBL,RP,4
0275   *
0276   *
0277   ************************************
0278   *****VECTOR INSTRUCTION SET*******
0279   ************************************
0280   *
0281   *
0282   ***SINGLE PRECISION***
0283   *
0284   .VECT,RP,101460
0285   VPIV,RP,101461
0286   VABS,RP,101462
0287   VSUM,RP,101463
0288   VNRM,RP,101464
0289   VDOT,RP,101465
0290   VMAX,RP,101466
0291   VMAB,RP,101467
0292   VMIN,RP,101470
0293   VMIB,RP,101471
0294   VMOV,RP,101472
0295   VSWP,RP,101473
0296   .ERES,RP,101474
0297   .ESEG,RP,101475
0298   .VSET,RP,101476
```

```
0299  *
0300  ***DOUBLE PRECISION***
0301  *
0302  .DVCT,RP,105460
0303  DVPIV,RP,105461
0304  DVABS,RP,105462
0305  DVSUM,RP,105463
0306  DVNRM,RP,105464
0307  DVDOT,RP,105465
0308  DVMAX,RP,105466
0309  DVMAB,RP,105467
0310  DVMIN,RP,105470
0311  DVMIB,RP,105471
0312  DVMOV,RP,105472
0313  DVSWP,RP,105473
0314  *
0315  *
0316  *
0317  /E
0318  *
0319  ************************************
0320  *******TABLE GENERATION PHASE******
0321  ************************************
0322  *
0323  *****EQUIPMENT TABLE******
0324  *
0325  11,DVR32,D                          * EQT 01 7925 DISC
0326  12,DVA32,D,T=200                    * EQT 02 7906H DISC
0327  13,DVA05,B,X=13,T=12000             * EQT 03 SYSTEM CONSOLE (2645)
0328  14,DVA12,B,X=13,T=300               * EQT 04 2631 LINE PRINTER
0329  15,DVR37,B,X=50,T=20000             * EQT 05 HPIB
0330  16,DVR23,B,D                        * EQT 06 7970 MAG TAPE
0331  20,DVA05,B,X=13,T=12000             * EQT 07 2645 TERMINAL
0332  21,DVA05,B,X=13,T=12000             * EQT 08 2645 TERMINAL
0333  22,DVA05,B,X=13,T=12000             * EQT 09 2645 TERMINAL
0334  23,DVA05,B,X=13,T=12000             * EQT 10 2645 TERMINAL
0335  24,DVA05,B,X=13,T=12000             * EQT 11 2648 TERMINAL
0336  25,DVA05,B,X=13,T=12000             * EQT 12 2648 TERMINAL
0337  26,DVA05,B,X=13,T=12000             * EQT 13 2648 TERMINAL
0338  70,DVS43,M,X=18                     * EQT 14 SPOOLING
0339  71,DVS43,M,X=18                     * EQT 15 SPOOLING
0340  72,DVS43,M,X=18                     * EQT 16 SPOOLING
0341  73,DVS43,M,X=18                     * EQT 17 SPOOLING
0342  74,DVS43,M,X=18                     * EQT 18 SPOOLING
0343  75,DVS43,M,X=18                     * EQT 19 SPOOLING
0344  76,DVS43,M,X=18                     * EQT 20 SPOOLING
0345  77,DVS43,M,X=18                     * EQT 21 SPOOLING
0346  4,DVP43,M                           * EQT 22 POWER FAIL
0347  /E
0348  *
0349  ********DEVICE REFERENCE TABLE*********************
0350  *
0351  3                                   * LU 01 SYSTEM CONSOLE
0352  1                                   * LU 02 SYSTEM DISC (SUBCHANNEL 0)
0353  1,12                                * LU 03 AUX. DISC (SUBCHANNEL 12)
0354  3,1                                 * LU 04 LEFT CTU
0355  3,2                                 * LU 05 RIGHT CTU
0356  4                                   * LU 06 2631 LINE PRINTER
0357  5                                   * LU 07 HPIB
0358  6                                   * LU 08 7970 MAG TAPE
```

```
0359  1,1
0360  1,2
0361  1,3
0362  1,4
0363  1,5
0364  1,6
0365  1,7
0366  1,8
0367  1,9
0368  1,10
0369  1,11
0370  1,13
0371  1,14
0372  1,15
0373  1,16
0374  1,17
0375  1,18
0376  1,19
0377  1,20
0378  1,21
0379  1,22
0380  1,23
0381  1,24
0382  1,25
0383  1,26
0384  1,27
0385  1,28
0386  1,29
0387  1,30
0388  1,31
0389  2
0390  2,1
0391  2,2
0392  2,3
0393  2,4
0394  2,5
0395  2,6
0396  2,7
0397  2,8
0398  2,9
0399  22
0400  7
0401  8
0402  9
0403  10
0404  11
0405  12
0406  13
0407  7,1
0408  7,2
0409  7,4
0410  8,1
0411  8,2
0412  8,4
0413  9,1
0414  9,2
0415  9,4
0416  10,1
0417  10,2
0418  10,4
```

```
* LU 09 DISC SUBCHANNEL 1
* LU 10 DISC SUBCHANNEL 2
* LU 11 DISC SUBCHANNEL 3
* LU 12 DISC SUBCHANNEL 4
* LU 13 DISC SUBCHANNEL 5
* LU 14 DISC SUBCHANNEL 6
* LU 15 DISC SUBCHANNEL 7
* LU 16 DISC SUBCHANNEL 8
* LU 17 DISC SUBCHANNEL 9
* LU 18 DISC SUBCHANNEL 10
* LU 19 DISC SUBCHANNEL 11
* LU 20 DISC SUBCHANNEL 13
* LU 21 DISC SUBCHANNEL 14
* LU 22 DISC SUBCHANNEL 15
* LU 23 DISC SUBCHANNEL 16
* LU 24 DISC SUBCHANNEL 17
* LU 25 DISC SUBCHANNEL 18
* LU 26 DISC SUBCHANNEL 19
* LU 27 DISC SUBCHANNEL 20
* LU 28 DISC SUBCHANNEL 21
* LU 29 DISC SUBCHANNEL 22
* LU 30 DISC SUBCHANNEL 23
* LU 31 DISC SUBCHANNEL 24
* LU 32 DISC SUBCHANNEL 25
* LU 33 DISC SUBCHANNEL 26
* LU 34 DISC SUBCHANNEL 27
* LU 35 DISC SUBCHANNEL 28
* LU 36 DISC SUBCHANNEL 29
* LU 37 DISC SUBCHANNEL 30
* LU 38 DISC SUBCHANNEL 31
* LU 39 7906H DISC SUBCH 00
* LU 40 7906H DISC SUBCH 01
* LU 41 7906H DISC SUBCH 02
* LU 42 7906H DISC SUBCH 03
* LU 43 7906H DISC SUBCH 04
* LU 44 7906H DISC SUBCH 05
* LU 45 7906H DISC SUBCH 06
* LU 46 7906H DISC SUBCH 07
* LU 47 7906H DISC SUBCH 08
* LU 48 7906H DISC SUBCH 09
* LU 49 POWER FAIL
* LU 50 2645 TERMINAL #1
* LU 51 2645 TERMINAL #2
* LU 52 2645 TERMINAL #3
* LU 53 2645 TERMINAL #4
* LU 54 2648 TERMINAL #5
* LU 55 2648 TERMINAL #6
* LU 56 2648 TERMINAL #7
* LU 57 TERMINAL #1 LEFT CTU
* LU 58 TERMINAL #1 RIGHT CTU
* LU 59 TERMINAL #1 AUX. PRINTER
* LU 60 TERMINAL #2 LEFT CTU
* LU 61 TERMINAL #2 RIGHT CTU
* LU 62 TERMINAL #2 AUX. PRINTER
* LU 63 TERMINAL #3 LEFT CTU
* LU 64 TERMINAL #3 RIGHT CTU
* LU 65 TERMINAL #3 AUX. PRINTER
* LU 66 TERMINAL #4 LEFT CTU
* LU 67 TERMINAL #4 RIGHT CTU
* LU 68 TERMINAL #4 AUX. PRINTER
```

```
0419   11,1                                  * LU 69 TERMINAL #5 LEFT CTU
0420   11,2                                  * LU 70 TERMINAL #5 RIGHT CTU
0421   11,3                                  * LU 71 TERMINAL #5 GRAPHICS
0422   11,4                                  * LU 72 TERMINAL #5 AUX. PRINTER
0423   12,1                                  * LU 73 TERMINAL #6 LEFT CTU
0424   12,2                                  * LU 74 TERMINAL #6 RIGHT CTU
0425   12,3                                  * LU 75 TERMINAL #6 GRAPHICS
0426   12,4                                  * LU 76 TERMINAL #6 AUX. PRINTER
0427   13,1                                  * LU 77 TERMINAL #7 LEFT CTU
0428   13,2                                  * LU 78 TERMINAL #7 RIGHT CTU
0429   13,3                                  * LU 79 TERMINAL #7 GRAPHICS
0430   13,4                                  * LU 80 TERMINAL #7 AUX. PRINTER
0431   14                                    * LU 81 SPOOLING
0432   15                                    * LU 82 SPOOLING
0433   16                                    * LU 83 SPOOLING
0434   17                                    * LU 84 SPOOLING
0435   18                                    * LU 85 SPOOLING
0436   19                                    * LU 86 SPOOLING
0437   20                                    * LU 87 SPOOLING
0438   21                                    * LU 88 SPOOLING
0439   /E
0440   *
0441   ***** INTERRUPT TABLE *********
0442   *
0443   4,ENT,$POWR                           * POWER FAIL
0444   11,EQT,1                              * 7925 DISC
0445   12,EQT,2                              * 7906H DISC
0446   13,EQT,3                              * SYSTEM CONSOLE
0447   14,EQT,4                              * 2631 LINE PRINTER
0448   15,EQT,5                              * HPIB
0449   16,EQT,6                              * 7970 MAG TAPE
0450   17,EQT,6                              * 7970 MAG TAPE
0451   20,PRG,PRMPT                          * TERMINAL #1
0452   21,PRG,PRMPT                          * TERMINAL #2
0453   22,PRG,PRMPT                          * TERMINAL #3
0454   23,PRG,PRMPT                          * TERMINAL #4
0455   24,PRG,PRMPT                          * TERMINAL #5
0456   25,PRG,PRMPT                          * TERMINAL #6
0457   26,PRG,PRMPT                          * TERMINAL #7
0458   70,EQT,14                             * SPOOLING
0459   71,EQT,15                             * SPOOLING
0460   72,EQT,16                             * SPOOLING
0461   73,EQT,17                             * SPOOLING
0462   74,EQT,18                             * SPOOLING
0463   75,EQT,19                             * SPOOLING
0464   76,EQT,20                             * SPOOLING
0465   77,EQT,21                             * SPOOLING
0466   /E
0467   *
0468   ******SYSTEM BOUNDARIES
0469   *
0470   0                                     * CHANGE DRIVER PART
0471   100                                   * CHANGE RT COMMON
0472   1                                     * CHANGE BG COMMON
0473   *
0474   ******RESOURCES TABLES
0475   *
0476   64                                    * # I/O CLASSES
0477   10                                    * LU MAPPINGS
0478   32                                    * # R.N.'S
```

```
0479   100,400                  * BUFFER LIMITS
0480   32                       * ADDITIONAL BLANK ID SEGS
0481   50                       * ADDITIONAL SHORT ID SEGS
0482   4                        * ADDITIONAL ID EXTENSIONS
0483   32                       * PARTITIONS
0484   TR,1
```

Appendix F
Sample Generation Listing

This sample generation listing reflects
Software Revision 2001 (January 1980).

```
SYSLI   T=00003 IS ON CR JA    USING 00500 BLKS R=0000

0001
0002    RTE-IV GENERATOR MODEL 92068A     4:40 PM  MON.,  3  DEC., 1979
0003
0004    ECHO?
0005    YES                          * ECHO ON
0006
0007    OUTPUT FILE NAME?
0008    SESSY:DB:-43::4500            * OUTPUT FILE
0009
0010    SYSTEM DISC MODEL?
0011    7925                         * 7925 SYSTEM DISC
0012
0013    CONTROLLER SELECT CODE?
0014    12                           * CONTROLLER SELECT CODE
0015
0016    MODEL,#TRKS,FIRST CYL,HEAD,#SURFACES, UNIT,#SPARES FOR SUBCHNL:
0017      00?
0018    * DISC   #TRKS   1ST-CYL   HEAD   #SURFACES   UNIT   #SPARES
0019    7925,   256,      0,       0,        9,        0,       5    *SUBCHANNEL 0
0020      01?
0021    7925,  1500,     29,       0,        9,        0,      66    *SUBCHANNEL 1
0022      02?
0023    7925,   193,    203,       0,        9,        0,       5    *SUBCHANNEL 2
0024      03?
0025    7925,   193,    225,       0,        9,        0,       5    *SUBCHANNEL 3
0026      04?
0027    7925,   193,    247,       0,        9,        0,       5    *SUBCHANNEL 4
0028      05?
0029    7925,   193,    269,       0,        9,        0,       5    *SUBCHANNEL 5
0030      06?
0031    7925,   193,    291,       0,        9,        0,       5    *SUBCHANNEL 6
0032      07?
0033    7925,   193,    313,       0,        9,        0,       5    *SUBCHANNEL 7
0034      08?
0035    7925,   193,    335,       0,        9,        0,       5    *SUBCHANNEL 8
0036      09?
0037    7925,   193,    357,       0,        9,        0,       5    *SUBCHANNEL 9
0038      10?
0039    7925,   193,    379,       0,        9,        0,       5    *SUBCHANNEL 10
0040      11?
0041    7925,   193,    401,       0,        9,        0,       5    *SUBCHANNEL 11
0042      12?
0043    7925,   256,    423,       0,        9,        0,       5    *SUBCHANNEL 12
0044      13?
0045    7925,   193,    452,       0,        9,        0,       5    *SUBCHANNEL 13
0046      14?
0047    7925,   193,    474,       0,        9,        0,       5    *SUBCHANNEL 14
0048      15?
0049    7925,   193,    496,       0,        9,        0,       5    *SUBCHANNEL 15
0050      16?
0051    7925,   193,    518,       0,        9,        0,       5    *SUBCHANNEL 16
0052      17?
0053    7925,   193,    540,       0,        9,        0,       5    *SUBCHANNEL 17
0054      18?
0055    7925,   193,    562,       0,        9,        0,       5    *SUBCHANNEL 18
0056      19?
0057    7925,   193,    584,       0,        9,        0,       5    *SUBCHANNEL 19
0058      20?
```

```
0059    7925,   193,    606,    0,      9,      0,      5    *SUBCHANNEL 20
0060      21?
0061    7925,   193,    628,    0,      9,      0,      5    *SUBCHANNEL 21
0062      22?
0063    7925,   193,    650,    0,      9,      0,      5    *SUBCHANNEL 22
0064      23?
0065    7925,   193,    672,    0,      9,      0,      5    *SUBCHANNEL 23
0066      24?
0067    7925,    96,    694,    0,      9,      0,      3    *SUBCHANNEL 24
0068      25?
0069    7925,   150,    705,    0,      9,      0,      3    *SUBCHANNEL 25
0070      26?
0071    7925,    96,    722,    0,      9,      0,      3    *SUBCHANNEL 26
0072      27?
0073    7925,    96,    733,    0,      9,      0,      3    *SUBCHANNEL 27
0074      28?
0075    7925,   194,    744,    0,      9,      0,      4    *SUBCHANNEL 28
0076      29?
0077    7925,   194,    766,    0,      9,      0,      4    *SUBCHANNEL 29
0078      30?
0079    7925,   194,    788,    0,      9,      0,      4    *SUBCHANNEL 30
0080      31?
0081    7925,   114,    810,    0,      9,      0,      3    *SUBCHANNEL 31
0082
0083    SYSTEM SUBCHNL?
0084    0                       * SYSTEM SUBCHANNEL
0085
0086    AUX DISC (YES OR NO OR # TRKS)?
0087    YES                     * AUXILIARY DISC
0088
0089    AUX DISC SUBCHNL?
0090    12                      * AUXILIARY DISC SUBCHANNEL
0091
0092    TBG SELECT CODE?
0093    10                      * TBG SELECT CODE
0094
0095    PRIV. INT. SELECT CODE?
0096    0                       * NO PRIVILEGED INT. CARD
0097
0098    MEM. RES. ACCESS TABLE AREA II?
0099    YES                     * MEM. RES. ACCESS TABLE AREA II
0100
0101    RT MEMORY LOCK?
0102    YES                     * RT MEMORY LOCK
0103
0104    BG MEMORY LOCK?
0105    YES                     * BG MEMORY LOCK
0106
0107    SWAP DELAY?
0108    50                      * SWAP DELAY
0109
0110    MEM SIZE?
0111    512                     * MEMORY SIZE
0112
0113    BOOT FILE NAMR?
0114    0                       * BOOT FILE NAMF
0115
0116
0117    PROG INPUT PHASE:
0118    -
```

```
0119    *
0120    -
0121    *
0122    -
0123    **************PROGRAM INPUT PHASE************************
0124    -
0125    *
0126    -
0127    *
0128    -
0129    MAP ALL                         *MAP MODULES,GLOBALS,LINKS
0130    -
0131    LINKS IN CURRENT
0132    -
0133    REL,%CR4S1::SM                  * RTE-IVB  OP SYS
0134    -
0135    REL,%CR4S2::SM                  * RTE-IVB  OP SYS
0136    -
0137    REL,%SCNFX::SM                  * CONFIGURATOR EXTENSION
0138    -
0139    REL,%WHZAT::SM                  * WHZAT  (REV. CODE 2001 OR GREATER)
0140    -
0141    REL,%4AUTR::SM                  * AUTO RESTART
0142    -
0143    *
0144    -
0145    ********DRIVERS***************
0146    -
0147    *
0148    -
0149    REL,%DVR32::SM                  * 7905/06/20/25 DISC DRIVER
0150    -
0151    REL,%DVA32::SM                  * 7906H/7920H/7925H DISC DRIVER
0152    -
0153    REL,%STA32::SM                  * DVA32 TRACK MAP TABLE
0154    -
0155    REL,%DVR23::SM                  * 7970 MAG TAPE DRIVER
0156    -
0157    REL,%DVA05::SM                  * 264X TERMINAL DRIVER
0158    -
0159    REL,%4DP43::SM                  * RTE-IVB POWER FAIL
0160    -
0161    REL,%2DV37::SM                  * HPIB DRIVER
0162    -
0163    REL,%SRQ,P::SM                  * FOR HPIB
0164    -
0165    REL,%DVA12::SM                  * FOR 2631 LINE PRINTER
0166    -
0167    *
0168    -
0169    *********LIBRARIES**************
0170    -
0171    *
0172    -
0173    MAP OFF,MODULES
0174    -
0175    REL,%CLIB::SM                   * COMPILER LIBRARY
0176    -
0177    REL,%FF4,N::SM                  * FORTRAN-IV LIBRARY
0178    -
```

```
0179    REL,%RLIB1::SM                  * DOS-RTE RELOC. LIBRARY
0180    -
0181    REL,%RLIB2::SM                  * DOS-RTE RELOC. LIBRARY
0182    -
0183    REL,%RLIB3::SM                  * DOS-RTE RELOC. LIBRARY
0184    -
0185    REL,%4SYLB::SM                  * SYSTEM LIBRARY
0186    -
0187    REL,$LDRLB::SM                  * LOADER LIBRARY
0188    -
0189    REL,%DBUGR::SM                  * USER DEBUG LIBRARY
0190    -
0191    REL,$DSCLB::SM                  * ICD/MAC UTILITY LIBRARY
0192    -
0193    REL,$DKULB::SM                  * ICD/MAC DISC BACKUP LIBRARY
0194    -
0195    REL,%DECAR::SM                  * DECIMAL STRING ARITHMETIC LIB
0196    -
0197    REL,%IB4A::SM                   * HPIB LIBRARY
0198    -
0199    REL,%UTLIB::SM                  * UTIL,LIB,FOR COMPL,CLOAD,READT,WRITT
0200    -
0201    REL,%BAMLB::SM                  * BASIC CORE RESIDENT LIBRARY
0202    -
0203    REL,%RASLB::SM                  * BASIC SUBROUTINE LIBRARY
0204    -
0205    REL,%VLIB::SM                   * VIS LIBRARY
0206    -
0207    *
0208    -
0209    ************************************
0210    -
0211    *
0212    -
0213    REL,%BMPG1::SM                  * FILE MANAGER - PART 1
0214    -
0215    REL,%BMPG2::SM                  * FILE MANAGER - PART 2
0216    -
0217    REL,%BMPG3::SM                  * FILE MANAGER - PART 3
0218    -
0219    ***************
0220    -
0221    REL,%SMON1::SM                  * SESSION MONITOR #1
0222    -
0223    REL,%SMON2::SM                  * SESSION MONITOR #2
0224    -
0225    REL,%SPO1B::SM                  * SPOOLING
0226    -
0227    REL,%SPO2B::SM                  * SPOOLING
0228    -
0229    *
0230    -
0231    ****************
0232    -
0233    *
0234    -
0235    REL,%4LDR::SM                   * LOADR
0236    -
0237    REL,%EDITR::SM                  * EDITOR
0238    -
```

```
0239    *
0240    -
0241    ************************************
0242    -
0243    *
0244    -
0245    REL,%LGTAT::SM                  * LGTAT UTILITY
0246    -
0247    *
0248    -
0249    **********PROGRAMS***************
0250    -
0251    *
0252    -
0253    REL,%LSAVE::SM                  * LU SAVE PROGRAM
0254    -
0255    REL,%USAVE::SM                  * UNIT SAVE PROGRAM
0256    -
0257    REL,%RESTR::SM                  * RESTORE PROGRAM
0258    -
0259    REL,%LCOPY::SM                  * COPY PROGRAM
0260    -
0261    REL,%COMPL::SM                  * COMPL PROGRAM
0262    -
0263    REL,%CLOAD::SM                  * CLOAD PROGRAM
0264    -
0265    REL,%READT::SM                  * READT UTILITY
0266    -
0267    REL,%WRITT::SM                  * WRITT UTILITY
0268    -
0269    REL,%HELP::SM                   * HELP UTILITY
0270    -
0271    REL,%ACCTS::SM                  * ACCOUNTS PROGRAM
0272    -
0273    DISPLAY UNDEFS,TR
0274     UNDEFS
0275    &6940
0276    -
0277    -
0278    -
0279    -
0280    -
0281    -
0282    -
0283    -
0284    -
0285    TR
0286    -
0287    /E
0288     UNDEFS
0289    &6940
0290
0291    PARAMETERS
0292    -
0293    *
0294    ***************PARAMETER INPUT PHASE***************
0295    *
0296    0,RTR,1,1
0297    -
0298    WHZAT,1,41
```

```
0299    -
0300    /E
0301
0302    CHANGE ENTS?
0303    -
0304    *
0305    **************CHANGE ENTS?**************
0306    *
0307    *
0308    ****SCIENTIFIC INSTRUCTION SET******
0309    *
0310    TAN,RP,105320
0311    -
0312    SQRT,RP,105321
0313    -
0314    ALOG,RP,105322
0315    -
0316    ATAN,RP,105323
0317    -
0318    COS,RP,105324
0319    -
0320    SIN,RP,105325
0321    -
0322    EXP,RP,105326
0323    -
0324    ALOGT,RP,105327
0325    -
0326    TANH,RP,105330
0327    -
0328    DPOLY,RP,105331
0329    -
0330    /CMRT,RP,105332
0331    -
0332    /ATLG,RP,105333
0333    -
0334    .FPWR,RP,105334
0335    -
0336    .TPWR,RP,105335
0337    -
0338    *
0339    *
0340    ****DOUBLE INTEGER*******
0341    *
0342    *
0343    .DAD,RP,105014
0344    -
0345    .DSB,RP,105034
0346    -
0347    .DMP,RP,105054
0348    -
0349    .DDI,RP,105074
0350    -
0351    .DSBR,RP,105114
0352    -
0353    .DDIR,RP,105134
0354    -
0355    .DNG,RP,105203
0356    -
0357    .DIN,RP,105210
0358    -
```

```
0359     .DDE,RP,105211
0360     -
0361     .DIS,RP,105212
0362     -
0363     .DDS,RP,105213
0364     -
0365     .DCO,RP,105204
0366     -
0367     *
0368     *
0369     ****FAST FORTRAN*****
0370     *
0371     *
0372     DBLE,RP,105201
0373     -
0374     SNGL,RP,105202
0375     -
0376     .DFER,RP,105205
0377     -
0378     .XPAK,RP,105206
0379     -
0380     .BLE,RP,105207
0381     -
0382     .NGL,RP,105214
0383     -
0384     .XCOM,RP,105215
0385     -
0386     ..DCM,RP,105216
0387     -
0388     DDINT,RP,105217
0389     -
0390     .XFER,RP,105220
0391     -
0392     .GOTO,RP,105221
0393     -
0394     ..MAP,RP,105222
0395     -
0396     .ENTR,RP,105223
0397     -
0398     .ENTP,RP,105224
0399     -
0400     .PWR2,RP,105225
0401     -
0402     .FLUN,RP,105226
0403     -
0404     $SETP,RP,105227
0405     -
0406     .PACK,RP,105230
0407     -
0408     .CFER,RP,105231
0409     -
0410     ..FCM,RP,105232
0411     -
0412     ..TCM,RP,105233
0413     -
0414     .LBT,RP,105763
0415     -
0416     .SBT,RP,105764
0417     -
0418     .DLD,RP,104200
```

```
0419     -
0420     .DST,RP,104400
0421     -
0422     .MPY,RP,100200
0423     -
0424     .DIV,RP,100400
0425     -
0426     CLRIO,RP,2001
0427     -
0428     *
0429     *
0430     ****HFPP - TWO WORD****
0431     *
0432     *
0433     .FAD,RP,105000
0434     -
0435     .FSB,RP,105020
0436     -
0437     .FMP,RP,105040
0438     -
0439     .FDV,RP,105060
0440     -
0441     IFIX,RP,105100
0442     -
0443     .FIXD,RP,105104
0444     -
0445     FLOAT,RP,105120
0446     -
0447     .FLTD,RP,105124
0448     -
0449     *
0450     *
0451     ****HFPP - THREE WORD*****
0452     *
0453     *
0454     .XADD,RP,105001
0455     -
0456     .XSUB,RP,105021
0457     -
0458     .XMPY,RP,105041
0459     -
0460     .XDIV,RP,105061
0461     -
0462     .XFXS,RP,105101
0463     -
0464     .DINT,RP,105101
0465     -
0466     .XFXD,RP,105105
0467     -
0468     .XFTS,RP,105121
0469     -
0470     .IDBL,RP,105121
0471     -
0472     .XFTD,RP,105125
0473     -
0474     *
0475     *
0476     ****HFPP - FOUR WORD*****
0477     *
0478     *
```

```
0479     .TADD,RP,105002
0480     -
0481     .TSUB,RP,105022
0482     -
0483     .TMPY,RP,105042
0484     -
0485     .TDIV,RP,105062
0486     -
0487     .TFXS,RP,105102
0488     -
0489     .TINT,RP,105102
0490     -
0491     .TFXD,RP,105106
0492     -
0493     .TFTS,RP,105122
0494     -
0495     .ITBL,RP,105122
0496     -
0497     .TFTD,RP,105126
0498     -
0499     *
0500     *
0501     ****EMA*****
0502     *
0503     *
0504     .EMAP,RP,105257
0505     -
0506     .EMIO,RP,105240
0507     -
0508     MMAP,RP,105241
0509     -
0510     *
0511     *
0512     ****
0513     *
0514     *
0515     .MVW,RP,105777
0516     -
0517     .CMW,RP,105776
0518     -
0519     *
0520     *
0521     * FOUR WORD DOUBLE PRECISION
0522     *
0523     *
0524     Z$DBL,RP,4
0525     -
0526     *
0527     *
0528     ************************************
0529     *****VECTOR INSTRUCTION SET*******
0530     ************************************
0531     *
0532     *
0533     ***SINGLE PRECISION***
0534     *
0535     .VECT,RP,101460
0536     -
0537     VPIV,RP,101461
0538     -
```

```
0539     VABS,RP,101462
0540     -
0541     VSUM,RP,101463
0542     -
0543     VNRM,RP,101464
0544     -
0545     VDOT,RP,101465
0546     -
0547     VMAX,RP,101466
0548     -
0549     VMAB,RP,101467
0550     -
0551     VMIN,RP,101470
0552     -
0553     VMIB,RP,101471
0554     -
0555     VMOV,RP,101472
0556     -
0557     VSWP,RP,101473
0558     -
0559     .ERES,RP,101474
0560     -
0561     .ESEG,RP,101475
0562     -
0563     .VSET,RP,101476
0564     -
0565     *
0566     ***DOUBLE PRECISION***
0567     *
0568     .DVCT,RP,105460
0569     -
0570     DVPIV,RP,105461
0571     -
0572     DVABS,RP,105462
0573     -
0574     DVSUM,RP,105463
0575     -
0576     DVNRM,RP,105464
0577     -
0578     DVDOT,RP,105465
0579     -
0580     DVMAX,RP,105466
0581     -
0582     DVMAB,RP,105467
0583     -
0584     DVMIN,RP,105470
0585     -
0586     DVMIB,RP,105471
0587     -
0588     DVMOV,RP,105472
0589     -
0590     DVSWP,RP,105473
0591     -
0592     *
0593     *
0594     *
0595     /E
0596
0597
0598
```

```
0599    TABLE AREA I  <<PAGE 00001>>:
0600
0601
0602    EQUIPMENT TABLE ENTRY
0603
0604    EQT 01?
0605    *
0606    ************************************
0607    *******TABLE GENERATION PHASE*******
0608    ************************************
0609    *
0610    ******EQUIPMENT TABLE*******
0611    *
0612    11,DVR32,D                          * EQT 01 7925 DISC
0613
0614    EQT 02?
0615    12,DVA32,D,T=200                    * EQT 02 7906H DISC
0616
0617    EQT 03?
0618    13,DVA05,B,X=13,T=12000             * EQT 03 SYSTEM CONSOLE (2645)
0619
0620    EQT 04?
0621    14,DVA12,B,X=13,T=300               * EQT 04 2631 LINE PRINTER
0622
0623    EQT 05?
0624    15,DVR37,B,X=50,T=20000             * EQT 05 HPIB
0625
0626    EQT 06?
0627    16,DVR23,B,D                        * EQT 06 7970 MAG TAPE
0628
0629    EQT 07?
0630    20,DVA05,B,X=13,T=12000             * EQT 07 2645 TERMINAL
0631
0632    EQT 08?
0633    21,DVA05,B,X=13,T=12000             * EQT 08 2645 TERMINAL
0634
0635    EQT 09?
0636    22,DVA05,B,X=13,T=12000             * EQT 09 2645 TERMINAL
0637
0638    EQT 10?
0639    23,DVA05,B,X=13,T=12000             * EQT 10 2645 TERMINAL
0640
0641    EQT 11?
0642    24,DVA05,B,X=13,T=12000             * EQT 11 2648 TERMINAL
0643
0644    EQT 12?
0645    25,DVA05,B,X=13,T=12000             * EQT 12 2648 TERMINAL
0646
0647    EQT 13?
0648    26,DVA05,B,X=13,T=12000             * EQT 13 2648 TERMINAL
0649
0650    EQT 14?
0651    70,DVS43,M,X=18                     * EQT 14 SPOOLING
0652
0653    EQT 15?
0654    71,DVS43,M,X=18                     * EQT 15 SPOOLING
0655
0656    EQT 16?
0657    72,DVS43,M,X=18                     * EQT 16 SPOOLING
0658
```

```
0659    EQT 17?
0660    73,DVS43,M,X=18                 * EQT 17 SPOOLING
0661
0662    EQT 18?
0663    74,DVS43,M,X=18                 * EQT 18 SPOOLING
0664
0665    EQT 19?
0666    75,DVS43,M,X=18                 * EQT 19 SPOOLING
0667
0668    EQT 20?
0669    76,DVS43,M,X=18                 * EQT 20 SPOOLING
0670
0671    EQT 21?
0672    77,DVS43,M,X=18                 * EQT 21 SPOOLING
0673
0674    EQT 22?
0675    4,DVP43,M                       * EQT 22 POWER FAIL
0676
0677    EQT 23?
0678    /E
0679
0680
0681    DEVICE REFERENCE TABLE
0682
0683     001 = EQT #?
0684    *
0685    ********DEVICE REFERENCE TABLE*********************
0686    *
0687    3                               * LU 01 SYSTEM CONSOLE
0688
0689     002 = EQT #?
0690    1                               * LU 02 SYSTEM DISC (SUBCHANNEL 0)
0691
0692     003 = EQT #?
0693    1,12                            * LU 03 AUX. DISC (SUBCHANNEL 12)
0694
0695     004 = EQT #?
0696    3,1                             * LU 04 LEFT CTU
0697
0698     005 = EQT #?
0699    3,2                             * LU 05 RIGHT CTU
0700
0701     006 = EQT #?
0702    4                               * LU 06 2631 LINE PRINTER
0703
0704     007 = EQT #?
0705    5                               * LU 07 HPIR
0706
0707     008 = EQT #?
0708    6                               * LU 08 7970 MAG TAPE
0709
0710     009 = EQT #?
0711    1,1                             * LU 09 DISC SUBCHANNEL 1
0712
0713     010 = EQT #?
0714    1,2                             * LU 10 DISC SUBCHANNEL 2
0715
0716     011 = EQT #?
0717    1,3                             * LU 11 DISC SUBCHANNEL 3
0718
```

```
0719      012 = EQT #?
0720     1,4                              * LU 12 DISC SUBCHANNEL 4
0721
0722      013 = EQT #?
0723     1,5                              * LU 13 DISC SUBCHANNEL 5
0724
0725      014 = EQT #?
0726     1,6                              * LU 14 DISC SUBCHANNEL 6
0727
0728      015 = EQT #?
0729     1,7                              * LU 15 DISC SUBCHANNEL 7
0730
0731      016 = EQT #?
0732     1,8                              * LU 16 DISC SUBCHANNEL 8
0733
0734      017 = EQT #?
0735     1,9                              * LU 17 DISC SUBCHANNEL 9
0736
0737      018 = EQT #?
0738     1,10                             * LU 18 DISC SUBCHANNEL 10
0739
0740      019 = EQT #?
0741     1,11                             * LU 19 DISC SUBCHANNEL 11
0742
0743      020 = EQT #?
0744     1,13                             * LU 20 DISC SUBCHANNEL 13
0745
0746      021 = EQT #?
0747     1,14                             * LU 21 DISC SUBCHANNEL 14
0748
0749      022 = EQT #?
0750     1,15                             * LU 22 DISC SUBCHANNEL 15
0751
0752      023 = EQT #?
0753     1,16                             * LU 23 DISC SUBCHANNEL 16
0754
0755      024 = EQT #?
0756     1,17                             * LU 24 DISC SUBCHANNEL 17
0757
0758      025 = EQT #?
0759     1,18                             * LU 25 DISC SUBCHANNEL 18
0760
0761      026 = EQT #?
0762     1,19                             * LU 26 DISC SUBCHANNEL 19
0763
0764      027 = EQT #?
0765     1,20                             * LU 27 DISC SUBCHANNEL 20
0766
0767      028 = EQT #?
0768     1,21                             * LU 28 DISC SUBCHANNEL 21
0769
0770      029 = EQT #?
0771     1,22                             * LU 29 DISC SUBCHANNEL 22
0772
0773      030 = EQT #?
0774     1,23                             * LU 30 DISC SUBCHANNEL 23
0775
0776      031 = EQT #?
0777     1,24                             * LU 31 DISC SUBCHANNEL 24
0778
```

```
0779      032 = EQT #?
0780     1,25                    * LU 32 DISC SUBCHANNEL 25
0781
0782      033 = EQT #?
0783     1,26                    * LU 33 DISC SUBCHANNEL 26
0784
0785      034 = EQT #?
0786     1,27                    * LU 34 DISC SUBCHANNEL 27
0787
0788      035 = EQT #?
0789     1,28                    * LU 35 DISC SUBCHANNEL 28
0790
0791      036 = EQT #?
0792     1,29                    * LU 36 DISC SUBCHANNEL 29
0793
0794      037 = EQT #?
0795     1,30                    * LU 37 DISC SUBCHANNEL 30
0796
0797      038 = EQT #?
0798     1,31                    * LU 38 DISC SUBCHANNEL 31
0799
0800      039 = EQT #?
0801     2                       * LU 39 7906H DISC SUBCH 00
0802
0803      040 = EQT #?
0804     2,1                     * LU 40 7906H DISC SUBCH 01
0805
0806      041 = EQT #?
0807     2,2                     * LU 41 7906H DISC SUBCH 02
0808
0809      042 = EQT #?
0810     2,3                     * LU 42 7906H DISC SUBCH 03
0811
0812      043 = EQT #?
0813     2,4                     * LU 43 7906H DISC SUBCH 04
0814
0815      044 = EQT #?
0816     2,5                     * LU 44 7906H DISC SUBCH 05
0817
0818      045 = EQT #?
0819     2,6                     * LU 45 7906H DISC SUBCH 06
0820
0821      046 = EQT #?
0822     2,7                     * LU 46 7906H DISC SUBCH 07
0823
0824      047 = EQT #?
0825     2,8                     * LU 47 7906H DISC SUBCH 08
0826
0827      048 = EQT #?
0828     2,9                     * LU 48 7906H DISC SUBCH 09
0829
0830      049 = EQT #?
0831     22                      * LU 49 POWER FAIL
0832
0833      050 = EQT #?
0834     7                       * LU 50 2645 TERMINAL #1
0835
0836      051 = EQT #?
0837     8                       * LU 51 2645 TERMINAL #2
0838
```

```
0839     052 = EQT #?
0840    9                                * LU 52 2645 TERMINAL #3
0841
0842     053 = EQT #?
0843    10                               * LU 53 2645 TERMINAL #4
0844
0845     054 = EQT #?
0846    11                               * LU 54 2648 TERMINAL #5
0847
0848     055 = EQT #?
0849    12                               * LU 55 2648 TERMINAL #6
0850
0851     056 = EQT #?
0852    13                               * LU 56 2648 TERMINAL #7
0853
0854     057 = EQT #?
0855    7,1                              * LU 57 TERMINAL #1 LEFT CTU
0856
0857     058 = EQT #?
0858    7,2                              * LU 58 TERMINAL #1 RIGHT CTU
0859
0860     059 = EQT #?
0861    7,4                              * LU 59 TERMINAL #1 AUX. PRINTER
0862
0863     060 = EQT #?
0864    8,1                              * LU 60 TERMINAL #2 LEFT CTU
0865
0866     061 = EQT #?
0867    8,2                              * LU 61 TERMINAL #2 RIGHT CTU
0868
0869     062 = EQT #?
0870    8,4                              * LU 62 TERMINAL #2 AUX. PRINTER
0871
0872     063 = EQT #?
0873    9,1                              * LU 63 TERMINAL #3 LEFT CTU
0874
0875     064 = EQT #?
0876    9,2                              * LU 64 TERMINAL #3 RIGHT CTU
0877
0878     065 = EQT #?
0879    9,4                              * LU 65 TERMINAL #3 AUX. PRINTER
0880
0881     066 = EQT #?
0882    10,1                             * LU 66 TERMINAL #4 LEFT CTU
0883
0884     067 = EQT #?
0885    10,2                             * LU 67 TERMINAL #4 RIGHT CTU
0886
0887     068 = EQT #?
0888    10,4                             * LU 68 TERMINAL #4 AUX. PRINTER
0889
0890     069 = EQT #?
0891    11,1                             * LU 69 TERMINAL #5 LEFT CTU
0892
0893     070 = EQT #?
0894    11,2                             * LU 70 TERMINAL #5 RIGHT CTU
0895
0896     071 = EQT #?
0897    11,3                             * LU 71 TERMINAL #5 GRAPHICS
0898
```

```
0899      072 = EQT #?
0900     11,4                          * LU 72 TERMINAL #5 AUX. PRINTER
0901
0902      073 = EQT #?
0903     12,1                          * LU 73 TERMINAL #6 LEFT CTU
0904
0905      074 = EQT #?
0906     12,2                          * LU 74 TERMINAL #6 RIGHT CTU
0907
0908      075 = EQT #?
0909     12,3                          * LU 75 TERMINAL #6 GRAPHICS
0910
0911      076 = EQT #?
0912     12,4                          * LU 76 TERMINAL #6 AUX. PRINTER
0913
0914      077 = EQT #?
0915     13,1                          * LU 77 TERMINAL #7 LEFT CTU
0916
0917      078 = EQT #?
0918     13,2                          * LU 78 TERMINAL #7 RIGHT CTU
0919
0920      079 = EQT #?
0921     13,3                          * LU 79 TERMINAL #7 GRAPHICS
0922
0923      080 = EQT #?
0924     13,4                          * LU 80 TERMINAL #7 AUX. PRINTER
0925
0926      081 = EQT #?
0927     14                            * LU 81 SPOOLING
0928
0929      082 = EQT #?
0930     15                            * LU 82 SPOOLING
0931
0932      083 = EQT #?
0933     16                            * LU 83 SPOOLING
0934
0935      084 = EQT #?
0936     17                            * LU 84 SPOOLING
0937
0938      085 = EQT #?
0939     18                            * LU 85 SPOOLING
0940
0941      086 = EQT #?
0942     19                            * LU 86 SPOOLING
0943
0944      087 = EQT #?
0945     20                            * LU 87 SPOOLING
0946
0947      088 = EQT #?
0948     21                            * LU 88 SPOOLING
0949
0950      089 = EQT #?
0951     /E
0952
0953
0954     INTERRUPT TABLE
0955
0956     -
0957     *
0958     ***** INTERRUPT TABLE *********
```

```
0959    *
0960    4,ENT,$POWR                          * POWER FAIL
0961    -
0962    11,EQT,1                             * 7925 DISC
0963    -
0964    12,EQT,2                             * 7906H DISC
0965    -
0966    13,EQT,3                             * SYSTEM CONSOLE
0967    -
0968    14,EQT,4                             * 2631 LINE PRINTER
0969    -
0970    15,EQT,5                             * HPIB
0971    -
0972    16,EQT,6                             * 7970 MAG TAPE
0973    -
0974    17,EQT,6                             * 7970 MAG TAPE
0975    -
0976    20,PRG,PRMPT                         * TERMINAL #1
0977    -
0978    21,PRG,PRMPT                         * TERMINAL #2
0979    -
0980    22,PRG,PRMPT                         * TERMINAL #3
0981    -
0982    23,PRG,PRMPT                         * TERMINAL #4
0983    -
0984    24,PRG,PRMPT                         * TERMINAL #5
0985    -
0986    25,PRG,PRMPT                         * TERMINAL #6
0987    -
0988    26,PRG,PRMPT                         * TERMINAL #7
0989    -
0990    70,EQT,14                            * SPOOLING
0991    -
0992    71,EQT,15                            * SPOOLING
0993    -
0994    72,EQT,16                            * SPOOLING
0995    -
0996    73,EQT,17                            * SPOOLING
0997    -
0998    74,EQT,18                            * SPOOLING
0999    -
1000    75,EQT,19                            * SPOOLING
1001    -
1002    76,EQT,20                            * SPOOLING
1003    -
1004    77,EQT,21                            * SPOOLING
1005    -
1006    /E
1007
1008
1009    TABLE AREA I MODULES
1010
1011    $$TB1(0099)04070 04231  92067-16103 REV.2001 790911
1012       *$ERAB   04100
1013       *$PVCN   04102
1014       *EXEC    04072
1015       *XLUEX   04075
1016       *$LIBR   04104
1017       *$LIBX   04111
1018       *$PVST   04103
```

```
1019        *$UPIO   04116
1020        *$XCIC   04120
1021        *$YCIC   04122
1022        *$CIC    04124
1023        *$UIN    04126
1024        *$UCON   04133
1025        *$XEQ    04145
1026        *$XDMP   04147
1027        *$IDLE   04154
1028        *$SCD3   04163
1029        *$IDNO   04167
1030        *$MEU    04200
1031        *$LIST   04157
1032        *$MESS   04173
1033        *$WORK   04201
1034        *$$OP    04202
1035        *$ULLU   04203
1036        *$CGRN   04207
1037        *$MTM    04213
1038        *$OPSY   04214
1039        *$DATC   04215
1040        *$CL1    04227
1041        *$CL2    04230
1042        *$$CPU   04231
1043        *$CMAD   04221
1044        *$ACFL   04222
1045        *$LGON   04223
1046        *$LGOF   04224
1047        *$STH    04225
1048        *$LME$   04226
1049        *$DSCS   04216
1050        *$SHED   04220
1051     BP LINKAGE 01643
1052
1053     $BITM(0099)04232 04240  92567-16103 REV.1903 790420
1054        *!BITM   04232
1055     BP LINKAGE 01643
1056
1057     $MCON(0099)04241 04254  92067-16103 REV.1903 790213
1058        *$SMLK   04241
1059        *$SMLN   04242
1060        *$SMEX   04243
1061        *$SMCA   04246
1062        *$SMER   04247
1063        *$SMCP   04250
1064        *$SMID   04251
1065        *$SMGP   04252
1066        *$SMST   04254
1067        *$SMDL   04253
1068        *$SMII   04244
1069        *$SMD#   04245
1070     BP LINKAGE 01643
1071
1072     $TA32(0099)04255 04464  92067-16507 REV.2001 791015 AUX TRACK MAP TABLE
1073        *$TA32   04255
1074     BP LINKAGE 01643
1075
1076
1077     DRIVR PART 00002
1078      CHANGE DRIVR PART?
```

```
1079    *
1080    ******SYSTEM BOUNDARIES
1081    *
1082    0                                       * CHANGE DRIVER PART
1083
1084
1085    OP  01  <<PAGE 00003>>:
1086
1087    DVR32(0099)06007 10076  92067-16330 REV.2001 791029
1088       *I.32   07226
1089       *C.32   06223
1090    BP LINKAGE 01637
1091
1092    DVR23(0099)10102 11015  92202-16001 REV.1913 - 790202
1093       *I.23   10102
1094       *C.23   10761
1095    BP LINKAGE 01637
1096
1097    DVA12(0099)11016 11716   92001-16020  780511  REV 1826
1098       *IA12   11016
1099       *CA12   11233
1100    BP LINKAGE 01637
1101
1102
1103
1104    SUBSYSTEM GLOBAL AREA <<PAGE 00005>>:
1105
1106    (NONE)
1107
1108
1109    RT COMMON  00000
1110     CHANGE RT COMMON ?
1111    100                                     * CHANGE RT COMMON
1112    RT COM ADD     12000
1113
1114
1115    BG COMMON  00924
1116     CHANGE BG COMMON ?
1117    1                                       * CHANGE BG COMMON
1118    BG COM ADD     12144
1119    BG COMMON  01948
1120
1121
1122    SYSTEM DRIVER AREA  <<PAGE 00007>>:
1123
1124    DVP43(0099)16000 16637  92067-16004 REV.1926 790506
1125       *$POWR  16000
1126       *IP43   16602
1127       *CP43   16475
1128    BP LINKAGE 01632
1129
1130    DVS43(0099)16660 21644  92067-16350 REV.1903 790319
1131
1132
1133
1134    TABLE AREA II <<PAGE 00008>>:
1135
1136    # OF I/O CLASSES?
1137    *
1138    ******RESOURCES TABLES
```

```
1139    *
1140    64                                      * # I/O CLASSES
1141
1142    # OF LU MAPPINGS?
1143    10                                      * LU MAPPINGS
1144
1145    # OF RESOURCE NUMBERS?
1146    32                                      * # R.N.'S
1147
1148    BUFFER LIMITS (LOW, HIGH)?
1149    100,400                                 * BUFFER LIMITS
1150
1151    0030 LONG ID SEGMENTS USED
1152    # OF BLANK LONG ID SEGMENTS?
1153    32                                      * ADDITIONAL BLANK ID SEGS
1154
1155    0018 SHORT ID SEGMENTS USED
1156    # OF BLANK SHORT ID SEGMENTS?
1157    50                                      * ADDITIONAL SHORT ID SEGS
1158
1159    0000 ID EXTENSIONS USED
1160    # OF BLANK ID EXTENSIONS?
1161    4                                       * ADDITIONAL ID EXTENSIONS
1162
1163    MAXIMUM # OF PARTITIONS?
1164    32                                      * PARTITIONS
1165
1166
1167    TABLE AREA II MODULES
1168
1169    $$TB2(0099)31072 31176  92067-16103 REV.2001 791016
1170       *$MATA   31072
1171       *$MCHN   31073
1172       *$MBGP   31074
1173       *$MRTP   31075
1174       *$DLTH   31076
1175       *$DVPT   31077
1176       *$TIME   31100
1177       *$BATM   31103
1178       *$DLP    31105
1179       *$PLP    31106
1180       *$SSCT   31125
1181       *$STRK   31124
1182       *$ENDS   31107
1183       *$MPFT   31112
1184       *$BGFR   31113
1185       *$RTFR   31114
1186       *$IDEX   31115
1187       *$MRMP   31116
1188       *$MPS2   31120
1189       *$EMRP   31132
1190       *$MPSA   31117
1191       *$SDA    31121
1192       *$SDT2   31122
1193       *$CMST   31123
1194       *$COML   31126
1195       *$CFR    31127
1196       *$MNP    31130
1197       *$DVMP   31131
1198       *$RLB    31133
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1199        *$RLN    31134
1200        *$SBTB   31135
1201        *$OTAT   31110
1202        *$OPRI   31111
1203        *$SPCR   31143
1204        *$ELTB   31144
1205        *$PNTI   31154
1206        *$MAXI   31155
1207        *$SALI   31156
1208        *$SRTI   31157
1209        *$CES    31175
1210        *$LMES   31162
1211        *$SMEM   31160
1212     BP LINKAGE 01630
1213
1214     $OSAM(0099)31177 31233  92067-16103 REV.2001 791016
1215        *$OSAM   31177
1216        *$BRTX   31224
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1690        F.SET      41747 42137   92067-16185 REV.1903 760719
1691        CS..       42143 42374   92067-16185 REV.1903 790406
1692        READF      42375 43365   92067-16125 REV.2001 791015
1693        REID       43366 43512   92067-16268 REV.1903 790316
1694        FSTAT      43532 44112   92067-16125 REV.1903 790118
1695        LOCF       44114 44414   92067-16125 REV.1903 781110
1696        NAM..      44415 44511   92067-16125 REV.1903 740801
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1698        RWSUB      44541 45106   92067-16125 REV.1903 781003
1699        MSC.       45107 45150   92067-16125 REV.2001 790802
1700        LOCK.      45151 45223   92067-16125 REV.1903 781115
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1702        LULU.      47036 47131   92067-16125 REV.1903 780915
1703        SM.BF      47132 47355   92067-16125 REV.1903 781229
1704        CL.BF      47356 47755   92067-16125 REV.1903 780714
1705        UT.BF      47756 50355   92067-16125 REV.1903 780714
1706        GTSCB      50356 50513   92067-16125 REV.1903 790709
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1708     FMGR4(0099)37772 40004   92067-16185 REV.1903 790207
1709        MC..       40005 40237   92067-16185 REV.1903 790402
1710        RC..       40240 40525   92067-16185 REV.1903 790314
1711        CNUMD      40526 40545   92067-16268 REV.1903 770621
1712        $CVT3      40546 40633   92067-16268 REV.1903 770621
1713        AC..       40634 41032   92067-16185 REV.1903 790129
1714        MS..       41033 41343   92067-16185 REV.1903 780907
1715        PRTN       41344 41456   92067-16268 REV.1903 771005
1716        IDGET      41457 41541   92067-16268 REV.1903 790314
1717        F.UTM      41544 42037   92067-16185 REV.1940 790725
1718        READF      42051 43041   92067-16125 REV.2001 791015
1719        REID       43042 43166   92067-16268 REV.1903 790316
1720        NAM..      43167 43263   92067-16125 REV.1903 740801
1721        P.PAS      43264 43312   92067-16125 REV.1903 740801
1722        RWSUB      43313 43660   92067-16125 REV.1903 781003
1723        IPUT       43661 43701   92067-16125 REV.1903 740801
1724        WRIS$      43702 43740   92067-16125 REV.1903 740801
1725        %WRIS      43744 44341   750701  24998-16001
1726        DCMC       44373 46607   92067-16125 REV.2001 791016
1727        FD.CK      46676 47055   92067-16125 REV.1940 790802
1728        SM.BF      47056 47301   92067-16125 REV.1903 781229
1729        CL.BF      47302 47701   92067-16125 REV.1903 780714
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1733        RU..       40010 40742   92067-16185 REV.1903 790128
1734        IDGET      40743 41025   92067-16268 REV.1903 790314
1735        RP..       41026 41175   92067-16185 REV.1903 790510
1736        .RENM      41176 41321   92067-16185 REV.1903 780630
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1738        .OWNR      42064 42131   92067-16268 REV.1903 780919
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1742        TL..      43664 43703   92067-16185 REV.1903 740801
1743        HE..      43704 43735   92067-16185 REV.1903 781012
1744        WH..      43736 44020   92067-16185 REV.1903 781101
1745        CT..      44027 44421   92067-16185 REV.1903 790225
1746        NAMR      44422 44716    750701  24998-16001
1747        .SETB     44717 44773   92067-16268 REV.1903 780921
1748        OPENF     44774 45332   92067-16125 REV.1940 790724
1749        READF     45362 46352   92067-16125 REV.2001 791015
1750        REID      46371 46515   92067-16268 REV.1903 790316
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1753        RWSUB     46642 47207   92067-16125 REV.1903 781003
1754        CNT.      47210 47447   92067-16125 REV.1940 790802
1755        FCONT     47450 47542   92067-16125 REV.1903 780413
1756        BUMP.     47543 47601   92067-16125 REV.1903 741025
1757        SET.T     47602 47630   92067-16125 REV.1903 740801
1758        TL.       47631 47664   92067-16125 REV.1903 760322
1759        ST.TM     47665 47721   92067-16125 REV.1903 741223
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1774        DTACH     42726 43006   92067-16268 REV.1903 781202
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1776        OF..      43041 43172   92067-16185 REV.1903 790209
1777        LG..      43173 43251   92067-16185 REV.1903 780929
1778        LU..      43254 45114   92067-16185 REV.1903 790514
1779        CAPCK     45250 45574   92067-16268 REV.1940 790801
1780        IDGET     45575 45657   92067-16268 REV.1903 790314
1781        $ESTB     45660 45674   92067-16268 REV.1903 790202
1782        NAMF      45705 46214   92067-16125 REV.2001 790924
1783        READF     46226 47216   92067-16125 REV.2001 791015
1784        REID      47217 47343   92067-16268 REV.1903 790316
1785        POST      47344 47372   92067-16125 REV.1903 740801
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1787        P.PAS     47470 47516   92067-16125 REV.1903 740801
1788        RWSUB     47522 50067   92067-16125 REV.1903 781003
1789        SPOPN     50102 50165   92067-16125 REV.1940 790802
1790        SET.T     50166 50214   92067-16125 REV.1903 740801
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1792        B.FLG     50252 50320   92067-16125 REV.1903 741118
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1796        EX.TM     51005 51222   92067-16125 REV.1903 771115
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1811        LUSES     45471 45522   92067-16268 REV.1903 790122
1812        READF     45543 46533   92067-16125 REV.2001 791015
1813        REIO      46560 46704   92067-16268 REV.1903 790316
1814        POST      46705 46733   92067-16125 REV.1903 740801
1815        P.PAS     46734 46762   92067-16125 REV.1903 740801
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1817        SPOPN     47331 47414   92067-16125 REV.1940 790802
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1827        CAPCK     50731 51255   92067-16268 REV.1940 790801
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1837        READF     43617 44607   92067-16125 REV.2001 791015
1838        REIO      44641 44765   92067-16268 REV.1903 790316
1839        RWNDF     44766 45052   92067-16125 REV.1903 780724
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1844        FM.UT     46064 47675   92067-16125 REV.1903 790515
1845        CREA.     47676 50016   92067-16125 REV.1903 781102
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1848        SREAD     50173 50635   771116  24998-16001
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1853        READF     43035 44025   92067-16125 REV.2001 791015
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1855        FSTAT     44153 44533   92067-16125 REV.1903 790118
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1863      PGS.      46753 47061   92067-16125 REV.1903 781002
1864      ACNAM     47062 47653   92067-16125 REV.1903 790102
1865      POSNT     47660 50220   92067-16125 REV.1903 790316
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1877      READF     44243 45233   92067-16125 REV.2001 791015
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1887      KHAR      47661 50027   92067-16268 REV.1903 770525
1888      ME.SB     50036 51550   92067-16125 REV.1903 790510
1889      OPENF     51573 52131   92067-16125 REV.1940 790724
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1901      IXGET     41345 41354   92067-16268 REV.1903 780731
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1906      $SMVE     42303 42371   92067-16268 REV.1903 790202
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1914      LUTRU     44624 44732   92067-16268 REV.1903 790223
1915      READF     44733 45723   92067-16125 REV.2001 791015
1916      REIO      45731 46055   92067-16268 REV.1903 790316
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1923        R/W$      47265 47423   92067-16125 REV.1903 781214
1924        DCMC      47434 51650   92067-16125 REV.2001 791016
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1928        CL.BF     52405 53004   92067-16125 REV.1903 780714
1929        SESSN     53005 53022   92067-16125 REV.1903 780413
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1933        LSUB1     53735 54344   92067-16260 REV.1903 790206
1934        MESS$     54355 54710   92067-16261 REV.1903 790420
1935        MKSCB     54711 55061   92067-16261 REV.1903 780518
1936        RLSCB     55062 55177   92067-16261 REV.1903 780518
1937        VSCBA     55200 55245   92067-16261 REV.1903 790202
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1972        .SETB     47442 47516   92067-16268 REV.1903 780921
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1976        MESS$     50734 51267   92067-16261 REV.1903 790420
1977        CAPCK     51270 51614   92067-16268 REV.1940 790801
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1987      LUTRU     33645 33753   92067-16268 REV.1903 790223
1988      FNDLU     33756 34117   92067-16268 REV.1903 780403
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1990      $SMVE     34447 34535   92067-16268 REV.1903 790202
1991      .SETB     34536 34612   92067-16268 REV.1903 780921
1992      $ESTB     34613 34627   92067-16268 REV.1903 790202
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2005      $ALRN     34327 34444   92067-16268 REV.1903 770715
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2007      KCVT      34572 34605   92067-16268 REV.1903 770621
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2652    RT PARTITION REQMTS:
2653      AUTOR 02 PAGES
2654      SMP   06 PAGES
2655      JOB   05 PAGES
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2657    BG PARTITION REQMTS:
2658      $CNFX 04 PAGES
2659      FMGR  10 PAGES
2660      LOGON 11 PAGES
2661      LGOFF 10 PAGES
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2663      GASP  10 PAGES
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2669      READT 15 PAGES
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2671      HELP  05 PAGES
2672      LOADR 14 PAGES  *
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2674      USAVE 17 PAGES  *
2675      RESTR 16 PAGES  *
2676      ACCTS 17 PAGES  *
2677
2678    MAXIMUM PROGRAM SIZE:
2679    W/O COM 28 PAGES
2680    W/  COM 26 PAGES
2681    W/  TA2 20 PAGES
2682
2683
2684    SYS AV MEM:  03434 WORDS
2685
2686    ENTER 1ST PARTITION PAGE:  00049(DEFAULT) TO 00053:
2687    TR,1
2688    ENTER 1ST PARTITION PAGE:  00049(DEFAULT) TO 00053:
2689    0
2690
2691    SYS AV MEM:  03434 WORDS
2692
2693    PAGES REMAINING: 00463
2694
2695    DEFINE PARTITIONS:
2696
2697    PART  01, 0463 PAGES?
2698    3,RT
```

```
2699
2700     PART  02, 0460 PAGES?
2701     5,BG
2702
2703     PART  03, 0455 PAGES?
2704     6,BG
2705
2706     PART  04, 0449 PAGES?
2707     9,BG
2708
2709     PART  05, 0440 PAGES?
2710     11,BG
2711
2712     PART  06, 0429 PAGES?
2713     15,BG
2714
2715     PART  07, 0414 PAGES?
2716     19,BG
2717
2718     PART  08, 0395 PAGES?
2719     100,BGM
2720
2721     PART  09, 0295,(0100) PAGES?
2722     15,S
2723
2724     PART  10, 0295,(0085) PAGES?
2725     15,S
2726
2727     PART  11, 0295,(0070) PAGES?
2728     15,S
2729
2730     PART  12, 0295,(0055) PAGES?
2731     27,S
2732
2733     PART  13, 0295,(0028) PAGES?
2734     28,S
2735
2736     PART  14, 0295,(0000) PAGES?
2737     200,BG
2738
2739     SUBPARTTTIONS?
2740     YES
2741
2742     PART  15, 0095,(0200) PAGES?
2743     15,S
2744
2745     PART  16, 0095,(0185) PAGES?
2746     15,S
2747
2748     PART  17, 0095,(0170) PAGES?
2749     15,S
2750
2751     PART  18, 0095,(0155) PAGES?
2752     15,S
2753
2754     PART  19, 0095,(0140) PAGES?
2755     15,S
2756
2757     PART  20, 0095,(0125) PAGES?
2758     15,S
```

```
2759
2760    PART  21, 0095,(0110) PAGES?
2761    15,S
2762
2763    PART  22, 0095,(0095) PAGES?
2764    15,S
2765
2766    PART  23, 0095,(0080) PAGES?
2767    20,S
2768
2769    PART  24, 0095,(0060) PAGES?
2770    20,S
2771
2772    PART  25, 0095,(0040) PAGES?
2773    20,S
2774
2775    PART  26, 0095,(0020) PAGES?
2776    20,S
2777
2778    PART  27, 0095,(0000) PAGES?
2779    95,BGM
2780
2781    PART  28, 0000,(0095) PAGES?
2782    25,S
2783
2784    PART  29, 0000,(0070) PAGES?
2785    25,S
2786
2787    PART  30, 0000,(0045) PAGES?
2788    25,S
2789
2790    PART  31, 0000,(0020) PAGES?
2791    20,S
2792
2793    PART  32, 0000,(0000) PAGES?
2794    /E
2795
2796    MODIFY PROGRAM PAGE REQUIREMENTS?
2797    -
2798    FMGR,15
2799    -
2800    LOADR,18
2801    -
2802    EDITR,11
2803    -
2804    /E
2805
2806    ASSIGN PROGRAM PARTITIONS?
2807    -
2808    /E
2809
2810    SYSTEM STORED IN FILE
2811    SYS SIZE:062 TRKS, 032 SECS  (64 SECTORS/TRACK)
2812             =  04000 BLOCKS     (128 WORDS/BLOCK)
2813
2814    RT4GN FINISHED
2815
```

ERROR SUMMARY

APPENDIX

G

Appendix G
Error Summary

ON-LINE GENERATOR ERROR CODES

The On-Line Generator issues two types of error codes:

1. An error resulting from a file reference causes an FMP error code to be issued in the form:

   FMP ERR-nn filenm

   where:

   nn is a decimal number equivalent to the FMP error codes that are defined in the HP Batch-Spool Monitor Reference Manual.

   filenm is the file name or LU on which the error occurred.

   An FMP error may result from incorrect references to the list file, absolute output file, answer file, bootstrap file, scratch file, or a file specified in a RELOCATE command.

2. An error resulting from on-line generation processing causes a generator error to be issued in the form:

   GEN ERR nn
   (name)

   where:

   nn is a positive number representing the generator error codes defined below.

   (name) specifies, in some error messages, the program or entry point name, further identifying the cause of the error.

GEN ERR CODES

If an error condition is encountered during execution of the On-Line Generator program, the appropriate error code is printed on the list device and user console.

```
+------------------+
|                  |
|    GEN ERR 00    |
|                  |
+------------------+
```

Meaning: Irrecoverable error.

Action: If the error is accompanied by an FMP ERR, check the cause of the problem.

The problem may be hardware-oriented, symptomatic of disc transfer/DCPC problems, in which case the appropriate diagnostics should be run. Ensure that the memory configuration in which RT4GN is executing has the correct amount of physical memory.

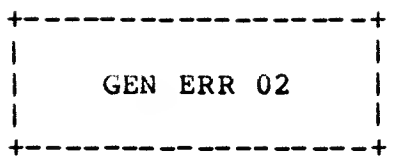
If the error is not accompanied by an FMP ERR, an actual generator problem (relating to its internal table structures) may exist, so send your generation listing and answer file to your local HP Field Service Office for analysis.

```
+------------------+
|                  |
|    GEN ERR 01    |
|                  |
+------------------+
```

Meaning: Invalid response to generator request.

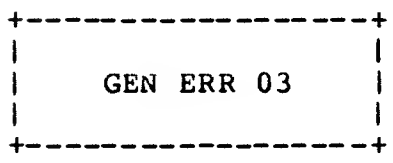
This is a general error message for invalid responses such as: incorrect type, number out of bounds, negative numbers, etc.

Action: Request is redisplayed. Enter valid response.



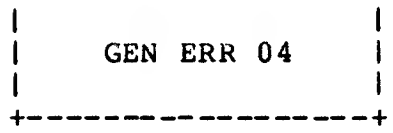
Meaning: Insufficient amount of available memory for internal generator tables.

Action: Irrecoverable error. Rerun the On-Line Generator program and either increase the partition size requirements or increase the the size of the background program in which the generator will run, as appropriate.



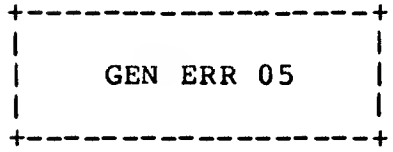
Meaning: Relocatable record out of sequence.

Action: Module is skipped; replace module. Message printed on list device only; control is not transferred to the user console.



Meaning: Illegal record type.

Action: Module is skipped. Message printed on list device only; control is not transferred to the user console.



Meaning: Duplicate entry point (the current entry point replaces the previous entry point).

Action: Revise program by relabeling the entry points. Message printed on list device only; control is not transferred to the user console.

```
+-----------------+
|                 |
|    GEN ERR 06   |
|                 |
+-----------------+
```

Meaning: Command error during Program Input Phase; often accompanied by an FMP error (see FMP error code definitions).

Action: Reenter valid command.

```
+-----------------+
|                 |
|    GEN ERR 07   |
|                 |
+-----------------+
```

Meaning: Generator symbol table overflow.

Action: Irrecoverable error. Rerun the On-Line Generator program and revise or delete programs. (Remember that programs may later be loaded on-line.)

```
+-----------------+
|                 |
|    GEN ERR 08   |
|                 |
+-----------------+
```

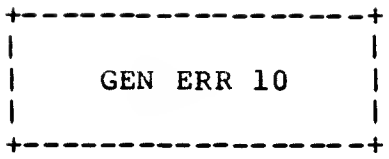
Meaning: Duplicate program name.

Action: The current program replaces the previous program. Message printed on list device only; control is not transferred to the user console.

```
+-----------------+
|                 |
|    GEN ERR 09   |
|                 |
+-----------------+
```

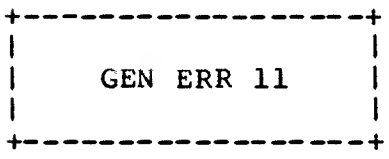
Meaning: Parameter name error. Program does not exist.

Action: Enter valid parameter statement.



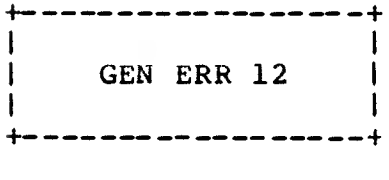
Meaning: Parameter type error, or EMA symbols (entry points) cannot be changed.

Action: Enter valid parameter statement.



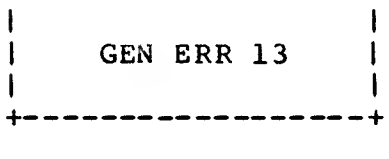
Meaning: Parameter priority error.

Action: Enter valid parameter statement.



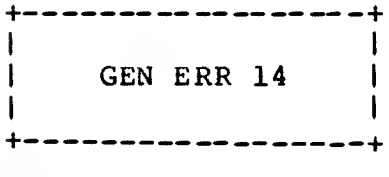
Meaning: Parameter execution interval error.

Action: Enter valid parameter statement.



Meaning: Program segment precedes main disc resident program.

Action: Module is skipped. Either revise module or reorder RELOCATE command entries.



Meaning: Checksum error on relocatable record.

Action: Module is skipped. Message printed on list device only; control is not transferred to the user console.

```
+-----------------+
|                 |
|    GEN ERR 15   |
|    name         |
|                 |
+-----------------+
```

Meaning: Illegal reference to a Type 7 module by a Type 6 or 14 module (name is the illegally referenced symbol).

Action: Revise the calling module. Message printed on list device only; control is not transferred to the user console.

```
+-----------------+
|                 |
|    GEN ERR 16   |
|                 |
+-----------------+
```

Meaning: Base page linkage overflow into driver link area. Link value is zero.

Action: Either revise programs and order of program loading or specify LINKS IN CURRENT to reduce linkage requirements. Message printed on list device only; control is not transferred to the user console.

```
+-----------------+
|                 |
|    GEN ERR 17   |
|                 |
+-----------------+
```

Meaning: 1. Following the OUTPUT FILE NAMR? query, the size parameter in the output file namr was not specified or was specified as less than the minimum size required (1000 blocks).

2. Type 1 output file overflow.

Action: For 1 above, reenter the response with the size parameter included. Estimate a large value if uncertain. For 2 above, it is an irrecoverable error. Rerun the On-Line Generator program increasing the size parameter in the output file namr.

```
+-----------------+
|                 |
|   GEN ERR 18    |
|                 |
+-----------------+
```

Meaning: Memory overflow (absolute code exceeds Last Word Available memory).

Action: If the configuration module plus links exceeds location 77577B (7900 and MAC based system), or 77377B (ICD based system), and if the generation is in memory resident load phase, the generator is aborted. Rerun the On-Line Generator program and revise order of program loading. Otherwise (for user programs), the message is printed on the list device only; control is not transferred to the user console.

```
+-----------------+
|                 |
|   GEN ERR 19    |
|                 |
+-----------------+
```

Meaning: Transfer (TR) request nesting level greater than ten; or empty stack.

Action: Revise and reenter response.

```
+-----------------+
|                 |
|   GEN ERR 20    |
|                 |
+-----------------+
```

Meaning: Transfer (TR) request was to an illegal logical unit for command input.

Action: Revise and reenter response.

```
+-----------------+
|                 |
|   GEN ERR 21    |
|                 |
+-----------------+
```

Meaning: System module containing entry point $CIC not loaded.

Action: Irrecoverable error. Rerun the On-Line Generator program after ensuring that all of the necessary system modules have been specified in RELOCATE commands.

```
+-----------------+
|                 |
|    GEN ERR 22   |
|                 |
+-----------------+
```

Meaning: List file error. Usually an FMP ERR-6 occurring when a list file extent cannot be created due to lack of disc space on the same subchannel.

Action: Respond YES or NO to the query OK TO CONTINUE?

A YES response causes the listed output to be sent to the user console only. A TR does not need to be done if command input was being received from an answer file or LU. (Note that the list file will be truncated at this point.)

A NO response terminates the generation.

```
+-----------------+
|                 |
|    GEN ERR 23   |
|                 |
+-----------------+
```

Meaning: Invalid S or M operands (must conform to previous EQT definitions using same driver) or system disc driver (whose EQT select code matches CONTROLLER SELECT CODE? response) cannot specify SDA.

Action: Enter valid EQT statement.

```
+-----------------+
|                 |
|    GEN ERR 24   |
|                 |
+-----------------+
```

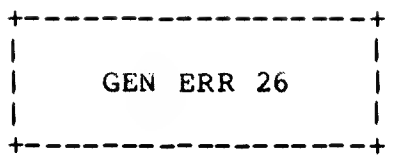
Meaning: Invalid select code number.

Action: Enter valid EQT statement.

```
+-----------------+
|                 |
|    GEN ERR 25   |
|                 |
+-----------------+
```

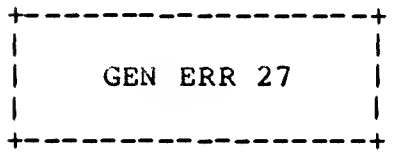
Meaning: EQT entry specified non-existent driver. Invalid driver name or no driver entry points.

Action: Enter valid EQT statement.



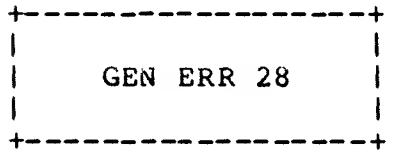
Meaning: Invalid or duplicate D, B, T, S, M, or X operands.

Action: Enter valid EQT statement.



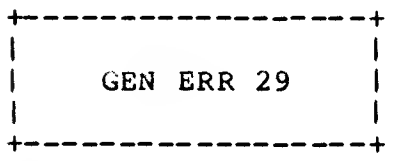
Meaning: Invalid equipment table number.

Action: Enter valid DRT statement.



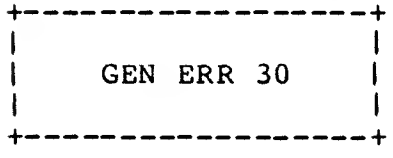
Meaning: Invalid select code number.

Action: Enter valid INT statement.



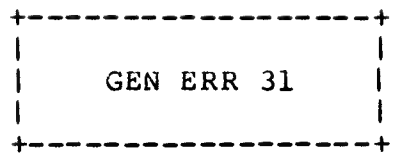
Meaning: Select code number decreasing.

Action: Enter valid INT statement (select codes must be entered in the Interrupt Table in ascending order).



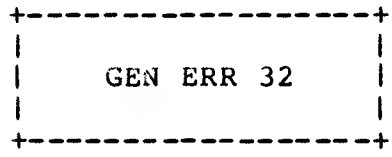
Meaning: Invalid mnemonic (meaning EQT, PRG, etc.).

Action: Enter valid INT statement.



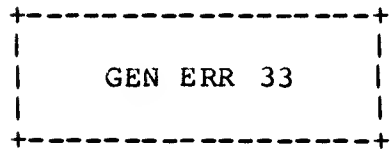
Meaning: Invalid EQT number in an INT statement.

Action: Enter valid INT statement.



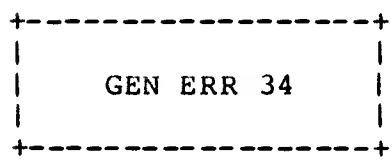
Meaning: Invalid program name in an INT statement.

Action: Enter valid INT statement.



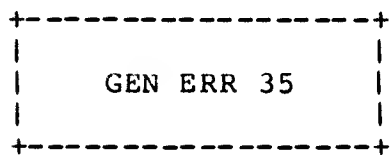
Meaning: Invalid entry point in an INT statement. If the entry refers to a driver entry point, the driver to be entered cannot reside in a driver partition.

Action: Enter valid INT statement.



Meaning: Invalid absolute value in an INT statement.

Action: Enter valid INT statement.



Meaning: More than 63 EQT or 254 DRT entries defined. Message printed until a /E encountered.

Action: Revise answer file.

```
+-----------------+
|                 |
|    GEN ERR 36   |
|                 |
+-----------------+
```

Meaning: Invalid number of characters in final operand (destination parameter).

Action: Enter valid INT statement.

```
+-----------------+
|                 |
|    GEN ERR 37   |
|    name         |
|                 |
+-----------------+
```

Meaning: Invalid declaration of COMMON in system or library program (name is the program's name).

Action: Revise the program. Message printed on list device only; control is not transferred to the user console.

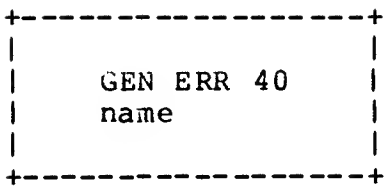
```
+-----------------+
|                 |
|    GEN ERR 38   |
|                 |
+-----------------+
```

Meaning: ID segment for the generator's largest segment cannot be found.

Action: Ensure that the generator and its program segments are properly loaded. (RT4GN and its segments must be loaded before you start your generation. The most common cause for this error is executing RT4GN when it and its segments are stored in Type 6 FMP files. In this case, make sure that RT4GN and its eight segments are restored with the RP command.)

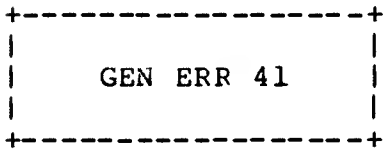
```
+-----------------+
|                 |
|    GEN ERR 39   |
|                 |
+-----------------+
```

NOT USED



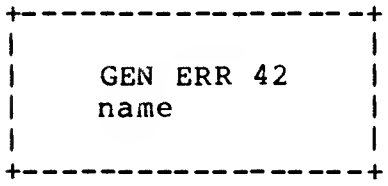
Meaning: Invalid EMA program type--must be real-time or background disc resident (name is the program's name).

Action: Revise program type. Program will not be loaded into the system during this generation unless it has a valid type.



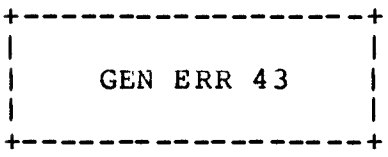
Meaning: Multiple EMA declarations in one program.

Action: Module is skipped. Revise the program.



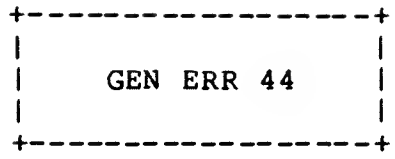
Meaning: Either invalid reference to an EMA symbol (entry point) by a non-EMA program or to an EMA symbol belonging to another program (name is the EMA symbol).

Action: The referencing instruction is replaced with a NOP. Revise the program.



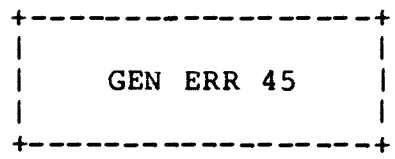
Meaning: Invalid mapping segment (MSEG) size for an EMA program. Either the generation-determined default size results in a value <=0, or the specified size was too large to fit in the user logical address space.

Action: The program relocation is aborted and no ID segment is built for that program. Revise the program.



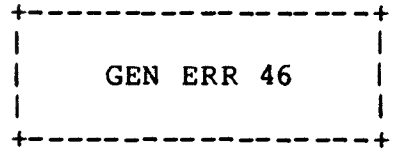
Meaning: Invalid response to ENTER 1st PARTITION PAGE XXXXX (DEFAULT) to YYYYY query.

Action: Reenter the response to define the System Available Memory extension within the range XXXXX to YYYYY, or enter a 0.



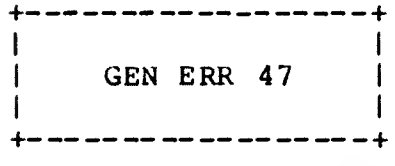
Meaning: Invalid partition size.

Action: Reenter partition description with valid decimal size, in the range of 1 through 1024 pages.



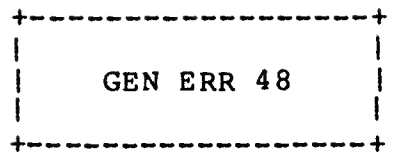
Meaning: Invalid partition type.

Action: Reenter partition description with valid type -- BG, RT, or S.



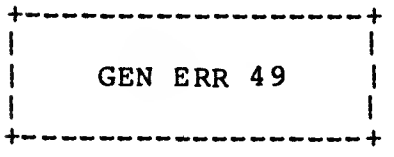
Meaning: Invalid reservation parameter.

Action: Reenter partition description. Third parameter must be an "R" to reserve a partition.



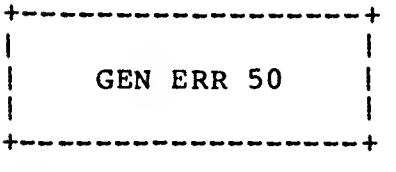
Meaning: Invalid or unknown program name.

Action: Either reenter response with corrected name or enter a /E to end this sequence.



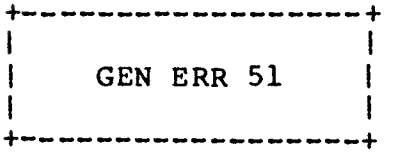
Meaning: Invalid partition number.

Action: Either reenter program partition assignment response with corrected number or, if defining partitions, enter a /E to end this sequence because the maximum number of partitions has been exceeded.



Meaning: Program specified is too large for partition assigned.

Action: Either assign program to a larger partition or continue without assigning this program.



Meaning: Invalid page size; either smaller than the program size, or larger than the maximum program size.

Action: Either reenter response with valid size or continue without overriding this program's page requirements.

```
+------------------+
|                  |
|    GEN ERR 52    |
|    name          |
|                  |
+------------------+
```

Meaning: Module being relocated references an SSGA entry point but does not have the proper program type to allow SSGA access (name is the SSGA entry point).

Action: Revise the calling module or, during Parameter Input Phase, change the main program involved to a type that allows SSGA access or to a Type 8 to delete it from the generation. Message printed on list device only; control is not transferred to the user console.

```
+------------------+
|                  |
|    GEN ERR 53    |
|                  |
+------------------+
```

Meaning: Upon receiving a /E, the sum of all partition sizes does not equal the number of pages remaining after System Available Memory.

Action: Redefine all partitions, until 0 pages remain.

```
+------------------+
|                  |
|    GEN ERR 54    |
|                  |
+------------------+
```

Meaning: A subroutine or segment has declared more COMMON than the associated main program.

Action: Recompile the main program, declaring the maximum COMMON needed by any segment or subroutine to be used. Message printed on list device only; control is not transferred to the user console.

```
+------------------+
|                  |
|    GEN ERR 55    |
|                  |
+------------------+
```

Meaning: The page requirements of an EMA program cannot be overridden.

Action: Entry is skipped. Message printed on list device only; control is not transferred to the user console.

```
+-------------------+
|                   |
|    GEN ERR 56     |
|                   |
+-------------------+
```

Meaning: Subpartition size is greater than the number of pages left in mother partition.

Action: Either revise and reenter response for last subpartition defined or return to RT/BG partition definition.

```
+-------------------+
|                   |
|    GEN ERR 57     |
|    name           |
+-------------------+
```

Meaning: A system module or entry point is missing (name is the entry point name).

Action: Irrecoverable error. Rerun the On-Line Generator program after ensuring that all necessary system modules have been specified in RELOCATE commands.

```
+-------------------+
|                   |
|    GEN ERR 58     |
|    name           |
|                   |
+-------------------+
```

Meaning: Illegal reference to a system (Type 0) module by a non-HP subsystem module (name is the entry point name).

Action: Revise the calling module. Message printed on list device only; control is not transferred to the user console.

```
+-------------------+
|                   |
|    GEN ERR 59     |
|                   |
+-------------------+
```

Meaning: Driver partition overflow.

Action: Irrecoverable error. Rerun the On-Line Generator program and increase the driver partition size to accomodate larger driver, or force driver into SDA (via its EQT definition).

```
+------------------+
|                  |
|    GEN ERR 60    |
|                  |
+------------------+
```

Meaning: Long ID Segment limit of 254 exceeded. If more than 254 ID segments will be used for generator-relocated programs, the generator aborts, and the request for # OF BLANK ID SEGMENTS? is not displayed.

Otherwise the request is redisplayed if the limit is exceeded after the user specifies the number of blank ID segments (meaning that the total of the number of ID segments to be used at generation time, plus the number of blank ID segments specified by the user is greater than 254).

Action: Either enter valid response or reduce the number of programs.

```
+------------------+
|                  |
|    GEN ERR 61    |
|                  |
+------------------+
```

Meaning: Physical memory overflow (number of pages declared exceeded).

Action: Irrecoverable error. Rerun the On-Line Generator program and revise your answer file.

```
+------------------+
|                  |
|    GEN ERR 62    |
|                  |
+------------------+
```

Meaning: Invalid instruction reference to an EMA symbol -- an instruction either references the symbol with offset or with indirect.

Action: Violating instruction will be NOP'ed for this relocation. Revise program before next relocation. Message printed on list device only; control is not transferred to the user console.

Appendix H
RTE-IV Program Types

Table H-1 provides a list of the default program types of the libraries and programs distributed with the RTE-IV operating system. The default program type is listed in the first column, and the remaining columns list the additional available program types. Each row of the table lists a program name or a library file name and indicates whether or not the corresponding program types available are allowed for that respective program or library (a "YES" meaning that the listed type is allowed, a "NO" meaning that the listed type is not allowed).

Note that several of the listed spool modules require SSGA access.

Table H-1. RTE-IV Progam Types

PROGRAM OR LIBRARY FILE NAME	DEFAULT TYPE	TYPE 1 without TA II	TYPE 1 with TA II	TYPE 2	TYPE 3	TYPE 4	SSGA REQUIRED*
LOADR	4	NO	NO	YES	YES	YES	NO
PRMPT	1	YES	YES	YES	YES	YES	NO
RSPNS	1	YES	YES	YES	YES	YES	NO
AUTOR	2	YES	YES	YES	YES	YES	NO
$CNFX	3	NO	NO	NO	YES	NO	NO
WHZAT	1	YES	YES	YES	YES	YES	NO
LGTAT	3	YES	YES	YES	YES	YES	NO
RT4GN	3	NO	NO	YES	YES	YES	NO
SWTCH	3	NO	NO	YES	YES	YES	NO
FMGR	3	NO	NO	YES	YES	NO	NO
D RTR	2	YES	YES	YES	YES	YES	NO
EDITR	3	NO	NO	YES	YES	NO	NO
XREF	3	NO	NO	YES	YES	NO	NO
FTN4	3	NO	NO	YES	YES	NO	NO
ASMB	3	NO	NO	YES	YES	NO	NO
KEYS	3	YES	YES	YES	YES	YES	NO
KYDMP	3	YES	YES	YES	YES	YES	NO
#EMA	3	NO	NO	YES	YES	YES	NO
LSAVE	4	YES	YES	YES	YES	YES	NO
USAVE	4	YES	YES	YES	YES	YES	NO
RESTR	4	YES	YES	YES	YES	YES	NO
VERFY	3	NO	NO	YES	YES	YES	NO
LCOPY	4	YES	YES	YES	YES	YES	NO
MSAFD	3	NO	NO	YES	YES	NO	NO
FORMT	3	YES	YES	YES	YES	YES	NO
SAVE	3	NO	NO	YES	YES	YES	NO
RSTOR	3	NO	NO	YES	YES	YES	NO
COPY	3	NO	NO	YES	YES	YES	NO
JOB	2	NO	NO	YES	YES	NO	NO
GASP	19	NO	NO	NO	YES	NO	YES
SMP	18	NO	YES	YES	YES	NO	YES
EXTND	17	NO	YES	YES	YES	NO	YES
SPOUT	17	NO	YES	YES	YES	NO	YES
RLIB (RTE/DOS Relocatable Library)		YES	YES	YES	YES	YES	NO
BMLIB (Batch Monitor Library)		YES	YES	YES	YES	YES	NO
(Spool Library)		NO	YES	YES	YES	NO	NO
CLIB (Compiler Library)		NO	NO	YES	YES	NO	NO
DECAR (Decimal String Library)		YES	YES	YES	YES	YES	NO
DBUGR (Debug Subroutine)		NO	NO	YES	YES	YES	NO
SYLIB (System Library)		YES	YES	YES	YES	YES	NO

*Add 16 to the desired program type to obtain SSGA access.

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